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No. 63



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## CHINA REPORT

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## I. GENERAL INFORMATION

### GOALS OF AGRICULTURAL MODERNIZATION OUTLINED

Beijing GUANGMING RIBAO in Chinese 21 Sep 79 p 2

[Article by Yan Zelong [7346 3419 7893] of the Finance and Trade Commodities Economics Institute of the Chinese Academy of Social Sciences: "What Should Be Stressed In Agricultural Modernization?"]

[Text] Editor's Note: To begin from reality is the fundamental principle of all our endeavors. In this article, Comrade Yan Zelong's proposal, based on foreign experience and actual conditions pertaining in our country, that in the modernization of our national agriculture stress must presently be placed on the modernization of biotechnology, deserves serious attention. It is hoped that comrades involved in either practical or theoretical work will study and discuss it extensively.

In the implementation of the historic task of the Four Modernizations, modernization of agriculture is a rather complicated problem. What are the goals and the criteria of the modernization of our national agriculture? In a country with limited capital and material resources, where should the stress be placed first? This is a matter that affects all else, an issue on which success and failure hinges, and one that requires serious and realistic study.

Within the past 20 or 30 years, some industrially advanced countries have completed the modernization of their agriculture, and they possess experiences that merit our study and from which we can draw lessons, but we must also realize that the differences between our country and these countries are great. What is the modernization of agriculture? A currently popular view is that the modernization of agriculture consists of an "across-the-board mechanization" of technological equipment for agriculture in the style of industrially and agriculturally advanced countries, and an increase in the rate of productivity of agricultural labor. This concept seems incomplete because it encompasses the application of the most up to date science and technology to improvement of the soil, plant protection, breeding of superior

varieties, chemical fertilizers, farm chemicals, and herbicides, as well as water conservancy and irrigation, and management of agricultural fields. Both of these are interrelated, but the first of them--modernized mechanical equipment to replace men and animals--is the application of mechanized technology to agriculture, and mostly it solves the problem of conserving agricultural work time. The second one, which involves the application of modern genetics, ecology, zoology, microbiology, and agricultural chemistry to the planting and livestock industries is termed the "modernization of biotechnology." In terms of emphasis and pace, the goal in the modernization of our national agriculture should be to solve these latter problems making the former ones a rather longterm task.

Some industrially advanced countries such as the United States, West Germany, France, and Japan, who despite differences in the basic conditions and foundations of their agriculture, completed the modernization of their agriculture principally in the 10 or 20 year period between the 50's and the 70's, with the exception of the United States, which completed it earlier. The main reason impelling their rapid improvement in agricultural technology was the rather smooth post-war development of industrial production in the younger industrial countries that brought about reform of the entire economic structure together with demands for labor. The special characteristic of these countries in their modernization was that they modernized agriculture only after they had modern industry. Along with modern development came ever-increasing expenditures for investment costs, for raw materials and for energy. Though large amounts of farm labor was saved, the rate of production in terms of current labor rose remarkably while production of crops, particularly production per unit of area, did not show great increases. In the United States, Japan, Germany, and France, the number of tractors per 10,000 mu of cultivated land has increased rapidly during the past 25 years.

	USA	Japan	West Germany	France
1950	13.1	0.1	10.9	0.4
1960	16.9	1.0	66.8	3.7
1970	16.1	37.7	121.3	9.5
1975	13.1	41.9	119.3	10.5

In 1950, Japan had only 13,000 tractors in the entire country, but by 1975 the number had increased to 3.921 million. In 1955, farm trucks numbered only 60,000, but by 1975 the number increased to 1.106 million.

Publication capital for every farm in the United States averaged 6,200 yuan in 1940; in 1978 it was 189,000 yuan, an increase of more than 30 times. The American national average value for fixed assets of farm machinery per laborer, including farm transportation and other equipment, is about 12,000 American dollars, while the manufacturing industry has fixed assets per unit

of labor of only 55,000 dollars. In America, to produce 1 dollar's worth of farm products, an average investment of 8 dollars is required, while for each dollar of sales by the steel and iron industry, an average investment of only 50 cents is required.

In 1977, in all of West Germany (not including land and buildings) fixed agricultural assets were 108.2 billion marks, the equivalent of 79 billion renminbi, or an average 46,200 yuan per farm laborer. Production of 1 mark's worth of farm produce required an average investment of 3.35 marks worth of fixed assets.

Quantities of materials consumed in agriculture are astonishing. In America for example, the annual consumption of petroleum is 68 million tons, of steel products 8 million tons, and of rubber 160,000 tons. Consumption of electricity per mu of cultivated land is also great; in West Germany, where consumption is highest, it amounts to 52 kilowatt-hours. In the United States, it is 29.3 kilowatt hours, and Japan and France are equal with 22.6 kilowatt hours.

In short, within the space of 10 or 20 years investment in farm equipment has shown an increase of from 10 to as much as 100 percent. Because of the increased costs, the burden on farms and government inevitably became heavier. In 1978, owners of American farms owed a total of 119 billion American dollars in debts, a 9-fold increase over 1950. In 1979, the financial budget of the United States showed expenditures of 6.4 billion for disbursements of various kinds to support the prices of agricultural products. When some people suppose that American agriculture actually substitutes capital for labor, they are about right. In 1977 in Germany, federal government funds used in agriculture amounted to 13 billion marks. The single item, "support payments for fuel" accounted for 549 million marks. Of particular note in the national budget of West Germany is that expenditures for agriculture amount to 7 percent of all expenditures, but income from agriculture amounts to only 0.7 percent of total income from all sources. Expenditures amount to 7 times income. In France, the ratio of expenditures is also 5 times that of income. We must maintain a clear head about problems of this kind.

What is the effectiveness of such large expenditures by farms and government? Mostly it greatly reduces the ratio of the farm population to the general population. The following shows the remarkable changes that have taken place in the United States, Japan, Germany, and France during the past 26 years.

	USA	Japan	West Germany	France
1950	15.0	44.4	14.6	25.4
1976	2.6	13.9	5.5	10.6



It must be further explained that superficially it appears that the number of people employed in agriculture in the United States during the past 25 years declined from 7.51 million to 3.38 million and hours of work spent in agriculture from 15.1 billion hours decreased to 4.7 billion hours, but people engaged in servicing agriculture, and the hours spent by those providing facilities and energy for farm machinery are not included in the above statistics. So the saving in labor time that mechanization of agriculture brings is actually far lower than these figures show on the face of it. Further on the effectiveness of increased production, if the year 1970 is assigned a value of 100, the agricultural productivity index for the United States, Japan, Germany, and France during the past 20-odd years shows the following changes:

	USA	Japan	West Germany	France
1950	75	58	64	61
1976	121	109	103	108

Neither the ratio between agricultural investment and great increases in production nor effectiveness in increased production can be said to be very remarkable. For example, the total value of production from farming, forestry, livestock, and fisheries in the United States (as based on the 1976 index) was 26.1 billion dollars in 1947. In 1977, it was 38.3 billion dollars, an increase of only 46 percent in 30 years. Is such unspectacular economic performance solely a characteristic of capitalist countries. Not at all. Though the extent of agricultural mechanization in our own country is not high, a suggestion of this has begun to appear. In 1977, as compared with 1975, mechanized farm equipment increased 8.3 times, the amount of chemical fertilizer increased 2.3 times, and expenses of all kinds went up 1.3 times while total revenues from agriculture increased only 0.8 times. As another example, take the per unit yields of principal crops (expressed as jin per mu) in the United States, Japan, Germany and France:

	Foodstuffs	Wheat	Rice	Maize	Soybeans
USA	417	272	699	732	229
Japan	665	333	734	367	176
W. Germany	494	548		624	
France	452	501	545	513	

The situation varies from place to place. The degree of mechanization is highest in the United States, but the per unit yields are only at the medium level.

The economic benefits of investment in biotechnology are much better than investment in mechanized technology. In West Germany, there are only 1.83 mu of cultivated land per person, for which reason per unit yields are viewed with rather great importance. The reason they have been able to solve the agricultural problem in less than 20 years time is that they adopted simultaneous "modernization of machine technology" and "modernization of biotechnology," i.e. "investment of materials" and "investment of intelligence." The modernization of a biotechnology that included genetic breeding, soil studies, plant protection, a balanced natural ecology to provide forage, and chemical fertilizers was the main path they took to increased per unit yields. Analysis shows that the 81 percent increases in agricultural yields and the 71 percent increase in the rate of productivity of the United States between 1929 and 1972 is attributable to scientific research and the expansion of technology. Everyone is familiar with the "green revolution" carried out in Mexican agriculture. As a result of the extension over 95 percent of the area of superior varieties of wheat with short stems, resistance to disease, and high yields, and through increases in the use of chemical fertilizers, average per mu yields rose from 126 jin in 1949 to 561 jin in 1976; nationwide yields of wheat which between 1948 and 1952 had averaged 5.34 million tons increased by 2.45 million tons in 1971, a 3.5 fold increase. Both per unit yields and speed of development were the highest in the world. Similar measures using superior varieties and chemical fertilizers also brought remarkable results with Philippine rice, and in the expansion of the cultivation of wheat and rice in India. In the United States from 1950 to 1976, as a result of the use of superior breeds and improved feeds and despite a decrease in the number of milk cows, pigs, sheep, and chickens (including a decline by more than one-half in the number of milk cows), an increase occurred in the production of meat, milk and eggs. Both the feeding time and the amount of feed consumed by chickens intended for food were cut in half. The economic benefits of investment in biotechnology are just the opposite of investment in mechanization. According to analyses of the United States Department of Agriculture and of experts, for every American dollar invested in research and education from 1933 and 1977, 4.3 American dollars worth of benefits can be derived from increased production within 13 years. For every dollar spent for research and the expansion of hybrid maize varieties between 1940 and 1955, there have been 7 dollars returned. Analysis of the situation in other countries shows similar ratios of value.

Since the sources of materials for the figures introduced above differ, and since the statistical units are not entirely the same, possibly some are not entirely accurate, but overall, may the following be stated as a conclusion: to solve the agricultural problem, in countries or regions where there are large amounts of land and few people, stress should be on "modernized machine technology;" in countries or regions where land is scarce but people numerous, the stress should be on "modernized biotechnology;" and in countries or regions where both land and people are scarce, both must be pursued equally.

If further thought is given to the need in "modernized machine technology" for large amounts of investment, the need for a foundation of abundance in materials and a developed level of industrial production, and the need for relatively high levels of national science and technology, then in poor countries and in countries where production is undeveloped, the focus must be placed first upon "investment of intelligence." "Investment of material resources" must be based on conditions and abilities. Such an idea seems to fit the realities.

The situation in China is well known: a large population on scant cultivated land. Though there is an additional several hundred million mu of wasteland that may be opened up, still in view of the continued rise in population, not much change will occur in the basic situation. Consequently, the key to the development of agricultural production in our country can only be increased per unit yields. If the "across-the-board" mechanization" of some industrially and agriculturally advanced countries is taken as the standard, our agricultural investment would have to be 100 billion or 1 trillion. The industrial level of our country is low; the country is poor; and its scientific and technical strength is inadequate. At the present time, from both a financial or material standpoint, such a burden is impossible to bear. And a retrenchment in the employment of more than 200 million people in rural villages over the next 10 or 20 years would present difficulties almost impossible to imagine. Strengthening of scientific experiments in agriculture, however, requires little investment and offers great results. The United States spends only an average 1.5 billion dollars each year on such research (actual expenditures for 1978 were somewhat in excess of 2 billion American dollars, and this year the amount budgeted is 1.4 billion). Therefore, the road to the modernization of our agriculture can only be, first of all, the concentrated development of scientific research in agriculture and the expansion of technology, including that of the agricultural chemical industry. Mechanized farm equipment must be separated into different regions with a different emphasis in different circumstances. Most regions must first solve the partial redundancy in physical labor and the seasonal sudden demand for labor. Of course, our country is a socialist country. How agriculture develops, and how the farmers will live and work in the future is directly related to the consolidation and development of the dictatorship of the proletariat itself. To allow the farmers finally to free themselves from several thousand years of strenuous physical labor, improve their livelihoods, and gradually eradicate differences between industry and agriculture is a long range task that must be completed. In the mechanization of agriculture neither a negative nor a passive attitude may be adopted. But the speed of mechanization depends on the speed of development of the entire national economy, the growth of the industrial base, and financial and material conditions, particularly the concrete conditions existing in the development of commune and brigade agriculture, forestry, livestock raising, sideline industries, fishing, and commune and brigade operated enterprises and their ability to supply capital and absorb labor. To pay no heed to conditions but to blindly chase after "across-the-board mechanization," does not appear to be workable.

# FARMING SYSTEM REFORM DISCUSSED

Beijing GUANGMING RIBAO in Chinese 11 Sep 79 p 2

[Article by Lu Shijian [0712 0013 4675]: "To Reform Farming System, We Must Seek Truth From Facts"]

[Text] Seeking truth from facts, everything proceeding from reality and acting according to real conditions constitute a fundamental principle of Marxism-Leninism and Mao Zedong thought. To reform the farming system, we must also follow this principle.

In China, the farming system was reformed on two occasions in the 50's and 70's. On the first occasion, single cropping was changed to double cropping, intercropping to continuous cropping, and three croppings in 2 years to two croppings in 1 year. On the second occasion, double cropping was changed to triple cropping or three sowings and three harvests a year. Both reforms had played the important role of promoting the development of agriculture and increasing the grain output of our country.

Ours is a country having a large population but limited arable land. To feed some 900 million people from 1.5 billion mu of farmland, it is necessary to make full use of our fine natural conditions, increase the index of multiple cropping and raise the per-mu yield of grain to the maximum. This is the goal of our reforms of the farming system. In recent years, we have greatly increased the index of multiple cropping. It was 151 percent in 1978, higher than that of 1971 by 6.4 percent, which is equal to an additional tilled acreage of about 97 million mu. With an increase of 34 percent in per-mu yield, the national output of grain last year showed an increase of 21.8 percent over that of 1971. Therefore, it may be seen that increasing the index of multiple cropping and raising the per-mu yield of grain fields constitute an important measure for boosting the total output of foodgrain. Thus, the direction of reforming the farming system and increasing the index of multiple cropping is correct.

However, some problems did emerge in the work of reforming farming systems. For instance, some localities accused the failure to carry out the double/triple cropping system and the 3-sowing and 3-reaping system as constituting a "problem of line" and a "problem of direction," and used big labels



to designate assignments. They even made rigid rules to enforce the double/triple cropping system or the 3-sowing and 3-reaping system by 100 percent. As a result, some communes and brigades which had no necessary conditions for the task were compelled to follow the rules, resulting in reduced grain output. The livelihood of the masses was thus adversely affected to their strong dissatisfaction.

Talking about the reform of farming system, we must seek truth from facts, that is, to promote multiple cropping according to actual local conditions. It won't do to use coercion and command without considering the conditions. In some places, the leading cadres were fond of taking isolated cases of advanced units as examples of increasing production, and told the whole area to follow suit, thus trying to achieve "forced uniformity." As a matter of fact, there are great differences between conditions of advanced units and those over large areas. Even in a same county, or with different brigades under a same commune, conditions are often not the same. Not only natural conditions are not identical, the conditions of production, technology and cadres are also different. All these will affect the results of the work of reforming the farming system. First of all, the conditions of land and labor are often different. For instance, in Wuxian County, Jiangsu, though on the average each person has one mu of farmland throughout the county, the county's eastern part is different from the western part. In the eastern part, on the average each person has one and a half mu to 2 mu of land; in the western part, on the average each person has only about 0.7 to 0.8 mu of land, or even only about 0.5 mu in some communes and brigades. Owing to different sizes of land worked by each person, after the reform of farming system there were differences in respect of the level of farming, crash reaping and crash sowing and in the quality of the application of fertilizer. Objectively, they make it impossible for these two areas to follow the same farming system. In the western part, it will be possible for some communes and brigades to increase production by adopting fully the triple-cropping system; in the eastern part, doing the same thing may possibly reduce output. Next, the fertilizer situations are different. According to results of experiment in many years made by the Institute of Agricultural Sciences in Wuxian County, Jiangsu, on the fertile soil with organic matter content reaching 3 percent and nitrogenous content of 0.18 percent, it requires 16,000 jin of fine-quality grass/pond mud and about 230 jin of nitrogenous chemical fertilizer to produce a per-mu yield of 1,500-1,600 jin from a triple cropping of wheat-rice-rice. In Pinggu County of Beijing Municipality, Yuegezhuang Brigade scored a per-mu yield of 1,400-1,500 jin of grain from three sowings and three harvests in 1978, by applying 16,000 jin organic manure, 200 jin nitrogenous chemical fertilizer and 100 jin phosphatic fertilizer per mu on the average. This fully explains that in high yielding places, it is always necessary to use large quantities of fertilizer as a foundation. Without adequate fertilizer, it is difficult to increase output. However, last year the national average application of chemical fertilizer was only a little over 50 jin per mu (it was below this average in many places), far short of the quantity required by multiple cropping for high yield. Therefore, in reforming the farming system, it is necessary to act according to the fertilizer situation. To popularize the system of multiple cropping beyond

the scope permitted by objective conditions, it will not be possible to gain success.

The purpose of reform is to increase grain output. If the increase is not much, the cost of production is very high, and the return is very little, is it still necessary to reform the farming system? In the north, some communes and brigades adopted the 3-sowing 3-reaping system, and their per-mu yield was only 400-500 jin. In the south, some communes and brigades planted three crops (wheat-rice-rice) in a year, and their per-mu yield was less than 1,000 jin. Such reforms gained no increase of either output or income, and may be considered as not justifying. According to our information, in some areas south of Changjiang River, even with a per-mu yield of 1,200-1,300 jin from three crops of grain in a year, it was better to keep the double cropping system. The Suzhou Prefecture may be taken as an example. In recent years, with the improvement in farmland capital construction, water conservancy and fertilizer conditions, and with higher technology of cultivation, the per-mu yield of wheat has reached 400-500 jin. Plus a late crop of rice, and even by using the "Laolaiqing" seeds, an old variety of the 50's, yielding 700 jin per mu (This was the output level over large areas in the 50's; the highest per-mu yield of this variety was 1,200-1,300 jin. On present conditions of production and technical level, the per-mu yield of a late crop over large areas may far exceed 700 jin.), the per-mu yield of double cropping may also reach 1,200-1,300 jin. If the same output of triple cropping can also be attained from the double cropping of wheat and rice, then it is not necessary to change to triple cropping. This is because in comparison with double cropping, each mu of triple cropping requires one-third more labor, one-fourth more chemical fertilizer and almost a double amount of seeds, thus increasing the cost of production. The double cropping of rice will also run the risk of abnormal weather. Therefore, in places where there are no favorable conditions, we should first still tap potentials of double cropping for increasing output, to achieve high and stable output and low cost of production. Only when the output of double cropping has reached a certain level of production, there is difficulty for further increase, and there are favorable conditions for triple cropping, then there is the necessity of changing double cropping to triple cropping. I believe that triple cropping is worthwhile only when it is better than "break-even," resulting in increases in both output and income; otherwise, it will bring about more loss than gain.

Talking about seeking truth from facts, we should also seek truth from facts when dealing with output after the reform of farming system. In some localities, especially with certain advanced communes and brigades, their current reports on the per-mu yield from triple cropping are not true. There are two reasons as follows: One is that the cultivated acreage is not true. According to information, a considerable number of communes and brigades have their own "helping fields." The acreage of "helping fields" constituted 20-30 percent, even over 40 percent, of the total crop acreage of some communes and brigades. The other reason is that the method of calculating per-mu yield is not scientific. Many communes and brigades,

and even some prefectures do not calculate their output according to the unified method laid down by the state statistical departments. Some brigades used three or four methods of calculation, from which differences of per-mu yield reached several hundreds of jin, even as high as 600-700 jin. Some units used these untrue figures to evaluate a farming system. This is not scientific.

It is a very complicated and meticulous work to evaluate a farming system for its merits and demerits. It requires that a certain number of experiments be conducted at designated spots in areas of different types. Under the same conditions, comparative experiments of different farming systems should be carried out in many consecutive years, including the comparison of such aspects as their output, soil fertility, employment of labor, income and insect pests and diseases, before scientific conclusions can be reached. At present, comparisons are made between the output of triple and double cropping of an area, a county or a commune; with incorrect statistical figures and dissimilar conditions of production, their reliability is poor. On this basis, arguments for and against triple or double cropping can hardly lead to any correct conclusion. To make a success of reforming the farming system, all places should, in coordination with the work of agricultural zoning being undertaken at present, carry out their investigation and study comprehensively and systematically on local natural conditions and conditions of production, find out the state of their natural resources of land, climate, water supply and fauna and flora, and continuously improve their conditions of production. With higher standards of scientific farming, and by seeking truth from facts, they should then stipulate short and long-term plans for the distribution of crops, rational crop rotation, the index of multiple cropping and the farming system.

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## NEW POLICIES BRINGING CHANGE TO RURAL ECONOMY

Hong Kong WEN WEI PO in Chinese 21 Sep 79 p 2

[Editorial: "New Changes in Rural Economy"]

[Text] Changes are taking place in the economy of China's boundless rural areas.

The motive force for these changes comes from the new policies of the central authorities. Besides implementing the policies toward rural communes and production brigades to respect their rights of ownership and decision-making, setting up the system of responsibility for production, assuring commune members of their private plots and family sideline production and encouraging trade at rural fairs, they recently even allowed the communes, brigades and production teams to develop their enterprises extensively. Local governments and leading departments at all levels were told that in the course of readjusting the national economy, they should make unified plans and comprehensively take into consideration the enterprises of communes and brigades, and make rational arrangements. All industrial and commercial departments should groom and back up these enterprises in this spirit.

There is a clear target for the development of the enterprises of rural communes and brigades, that is, to include these enterprises in the general tasks of readjusting the national economy and to make positive contributions to the present national economy.

In fact, rural commune and brigade enterprises have profound economic potentials. Last year's agricultural investment figures showed that the total investment made by all rural commune and brigade enterprises in the entire country in direct support of agriculture was more than 2.6 billion yuan in RMB, which was equal to more than 60 percent of last year's state investment in agricultural capital construction. Several billion yuan in wages were also put into the income distribution system of production teams, thus raising the income of commune members markedly.

This is a very encouraging change in the rural areas.

Rural enterprises include all kinds of productive activities in agriculture, forestry, industry, sideline production and fisheries. Such activities have a very wide scope and include a great many items. They give full play to the



peasants' enthusiasm to undertake the production and development of various enterprises, which will naturally bring about great changes in the rural economy.

Open channels to create material wealth.

According to statistics, last year 28 million peasants participated in rural enterprises. There must be many more participating this year. They joined in various departments of production to create output value and undertakings which form a formidable proportion of the national economy's income and made practical contributions to minimizing differences between cities and rural areas and between industry and agriculture. They have also done their part in preventing the excessive concentration of industries in urban areas and have opened effective channels for employment and the rational distribution of the labor force. The size of the rural enterprises is very flexible and their activities cover many fields, facilitating the arrangement of labor and employment to the satisfaction of all parties concerned. To educated youths working in rural areas, it is a correct means to do what they have learned and work for the reconstruction of the countryside.

Serve the expansion of export.

At present, our nation is launching the four modernizations. The situation demands that the export of native goods should be boosted in exchange for the necessary imported goods. With skillful operation and management, the rural enterprises will certainly become the production base of export commodities. For instance, in Guangdong's foreign trade, exports include grain and oils, foodstuffs, native products, tea, animal products, light industry articles and ceramic wares, most of which are produced in rural areas and can be handled by the commune enterprises. Small items for export, like flowers, birds, insects and fish, and tools for manual work, can all be raised or made by the rural enterprises through comprehensive planning. It will be advantageous to and bring no harm to the expansion of exports.

Contribute to the activation of the economic life in cities and rural areas. Since the beginning of this year there has been a sign of economic recovery in cities and rural areas throughout the country. The people's living has also improved somewhat. If the commune enterprises in the vast countryside can achieve still greater development, the urban and rural economy will certainly further change for the better, because goods produced by rural enterprises can be used in trade with the cities and can play a role in commodity regulation. Urban trade serving the rural areas can also supply the rural communes with goods and material and help the rural enterprises accelerate their development. In this way, the economic life in cities and rural areas will become active, to the great advantage of readjusting the national economy and raising the people's standard of living.

Various policies toward the rural areas are being implemented. The enterprises of communes and brigades are also undergoing changes and will play a positive role in the four modernizations. This should not be overlooked in viewing China's rural economy.

PEASANTS COMPLAIN ABOUT REDUCED STATE PROCUREMENT

Surplus of Agricultural Produce

Beijing RENMIN RIBAO in Chinese 8 Sep 79 p 2

[Abridged article by NCNA reporter Chen Bijiang [7115 1801 1412]: "Must Think More About the Peasants"]

[Text] [Editor's note] The implementation of the spirit of the Third Plenary Session of the 11th Party Central Committee has inspired the broad ranks of peasants, and good news of bumper harvests in agriculture have come frequently from various localities. But, in some places the commune members worked very hard and turned out agricultural and subsidiary produce which nobody came to purchase. As a result, what benefit the government gave to the peasants became "visible but untouchable." The peasants were worried because of the bumper harvest.

Some agricultural and subsidiary products were short on the market and not without buyers. The residents in the cities complained about the shortage of their supply. Facing this situation, the departments of commerce and those of supply and marketing should be glad to do something, and try to solve this problem by every means. However, some people of commercial departments said: "We are more than willing but lacking power." As a matter of fact, some units were "more than capable but lacking willingness" and did not "think more about the peasants." We hope that all these departments will emancipate their minds, overcome their style of bureaucracy, study the new situation, solve the new problem, think as the peasants do, realize the urgent needs of the peasants, take practical measures, make an effort to facilitate the exchange of goods between cities and rural villages, relieve the peasants from their worries after the bumper harvest and promote the development of production.

Recently, your reporter paid a visit to Tengxian County in Shandong Province and listened to peasants voicing strongly their demands to departments concerned that they should immediately take necessary measures to make a success of the state procurement of agricultural and subsidiary products, and shouldn't make the peasants suffer losses because they could not sell products which were grown through their hardship.

After the smashing of the "gang of four," particularly since the Third Plenary Session of the 11th CCP Central Committee, the county implemented the policy of rural economy so that the peasants began to show enthusiasm. The grain harvest was good, multiple undertakings developed very quickly, and the quantity of agricultural and subsidiary products for sale also increased greatly. But, the work of state procurement could not follow up, and the peasants could not sell their products. The situation was very serious. For instance, the purchasing agents refused to buy pigs which had been fattened for sale, because there were no quotas for procurement. These pigs could not be disposed of. In some places, there were too many pigs for sale, the agents could make their purchases only by drawing lots. Some commune members were eager to sell their pigs and could not but ask their relatives and friends to find "ways." Again for instance, the Irish potatoes grown locally contain plenty of starch and are large in size and easy to keep in storage. In the past, they were very popular at home and abroad. This year the total output of Irish potatoes in this county may reach 132 million jin. However, the current state procurement for home consumption and export is only 3 million jin. A large quantity of potatoes cannot be sold out.

Since last winter, there were several occasions when agricultural and subsidiary products found no buyers in Tengxian County, and the peasants suffered no small losses. In autumn last year, the county had some 10 million jin of white cabbage, but no purchasing agents came to buy them. The cabbage was left to rot. Last year the county harvested 40 million jin of yellow pears and left more than 7 million jin of them to rot, because there were no buyers. Such a state of affairs seriously hurt the enthusiasm of the peasants. They complained: "The government has repeatedly encouraged us to develop multiple undertakings, and raised the prices for the procurement of agricultural and subsidiary products. However, as soon as we developed production, no agents would come to make a purchase. What benefit the government gives us becomes visible but untouchable. Should we further develop production in the future?"

It is a good thing that the peasants have produced much more agricultural and subsidiary products; however, they have also made new demands to the departments concerned. This testifies to the fact that the methods of operation and management stipulated in the past when agricultural and subsidiary products were scanty is out of date. Under the new situation, it is necessary to study new measures with a view to promoting in a better manner the further development of agricultural and subsidiary production.

## Problems for Fruit Growers

[Abridged article by NCNA reproters Chen Zhaozhong [7115 2600 0022], Liu Xiao [0491 7197] and Zhou Guohua [0719 0948 5478]: "Why Are the Fruit Growers Worried After the Bumper Harvest?"]

[Text] Henan Province is a newly emerging base of apple production. In recent years, the province's 2 million mu of fruit trees have gradually matured, the output of apples has gained a yearly increase of about 100 million jin. This year, the increase will be even greater, being estimated to be more than 120 million jin net over that of last year. As a rule, bumper harvests were often followed by rejoicing. However, this year the fruit peasants, while rejoicing, are also worried by the following misgivings:

Firstly, the pricing for the procurement of apples is too low, and the income of growers will decrease. Year before last, the purchasing price for first grade apples was 20 cents per jin; last year it was cut down to 19 cents; and this year it is further forced down by 2 cents. The average price for different grades comes to only 13 or 14 cents, minus the cost of production, so what the growers can get is very little. From this price cutting alone, all fruit peasants will lose about 10 million yuan in income. This year, the cutting of price suppressed the enthusiasm for production among the peasants. Many units have reported to departments concerned that they were prepared to chop down the apple trees and sow instead other cash crops and grain.

Secondly, the department of supply and marketing has changed its method of operation. Instead of buying and selling on contract in past years, it changes to negotiated pricing; instead of agents collecting apples from growers' plantations, now the growers must deliver their products to the railway stations. These changes put a heavier burden on the growers. This year the department will procure only 180 million jin of apples, leaving the remaining 400 million jin to the people to buy at negotiated prices. The apple growers have no experience in marketing nor in ways of pushing sales, and cannot find quickly the market for such huge quantities of apples. There will be great confusion caused by human failure. Furthermore, this year the department is asking growers living scores and hundreds of li away to deliver their products to the railway station for state procurement, and the cost of transportation and the damage and loss in transit will all be borne by the producing units. According to the fruit peasants, the higher the output of a unit, the greater its loss of money. Indeed, they "put a burden on themselves by planting apple trees."

Thirdly, some provinces and cities do not abide by their contracts. This year Henan Province has made formal contracts with other provinces for the sale of 74 million jin of apples. Many provinces, cities and autonomous regions have strictly carried out the terms of their contracts and sent their agents to this province to take delivery of goods according to the schedule. However, a few provinces and cities unilaterally cancelled their contracts and up to now have failed to send their agents to Henan to take delivery of goods according to the schedule. Zhoukou Prefecture has signed a contract with a



certain province for the sale of 7.4 million jin of apples. At present, the time for harvesting is close, but the other party has failed to send anybody to make arrangement for delivery. The prefecture has spent scores of dollars sending telegrams to the other party for the implementation of the contract, but received no reply.

China has just begun to develop the production of apples. In formulating policies, the departments concerned must facilitate, not restrict, the development of apple production. As regards problems having appeared at present, the broad masses of fruit peasants are making the following urgent demands:

No 1: The department of supply and marketing must fully play the role of the channel of commodity circulation, actively promote local and outside business, widely seek markets and avoid the accumulation of apple stocks. In this respect, the action of Weishi County deserves imitation. To help apple growers to sell their products, this county's agency of supply and marketing sent out persons to push sales in other places, and set up more than 40 selling branches in the county itself. If all the basic-level cooperatives in the province can be mobilized to take action, the sale of apples will certainly be tremendous.

No 2: All contracts must be taken seriously. This year, Henan Province has signed scores of contracts for apple sales with other provinces, cities and autonomous regions, but up to the present only a dozen of them are executed. Such a situation should draw the serious attention of all departments concerned.

No 3: The fruit districts must expand their capabilities of storage and processing. Within 5 years, Henan Province will increase its output of apples at least by one-fold, up to 1.2 billion jin. At present, the province's fruit storehouses can hold only a few tens of millions of jin, and the capability of processing is next to nothing. This will be a very great contradiction. Therefore, the construction of storehouses and processing factories is an extremely urgent matter.

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PRC DELEGATE TO FAO CONFERENCE CITES WORLD FOOD ISSUES

OW140952 Beijing XINHUA in English 0715 GMT 14 Nov 79 OW

[Text] Rome, November 13 (XINHUA)--"The development of food production, especially in the developing world, is and will continue to be, for a long time to come, the pivot of action in the world food and agriculture sphere," said Xing Chongzhi, Chinese vice minister of agriculture, here this afternoon.

Xing Chongzhi, who is also the leader of the Chinese delegation to the 20th session of the United Nations Food and Agriculture Organization (FAO) conference, was speaking at the plenary session of the conference.

He expounded the Chinese Government policy of "readjusting, restructuring, consolidating and improving" the national economy and the policies aimed at acceleration the development of agriculture production.

Linking the development of agriculture to current international economic relationships; he said: "It is our hope that more and more developed countries will face up to the reality, recognize the developing countries' right to participate fully in decision. Making in international economic affairs, sit down to negotiate on equal footing with them so as to break the deadlock on the current negotiations, strengthen their ties of co-operation with the developing countries on the basis of independence, sovereignty and genuine equality, and provide more economic and technical assistance".

He concluded by saying: "The Chinese delegation will, as before, support other developing countries in their just struggle to increase food production, improve their position in international trade of agricultural produce and safeguard their sovereignty over their exclusive economic zones. We will strengthen economic and technical co-operation with other developing countries so that we can support each other and make progress together in our common struggle to set up a new international economic order in the food and agriculture sphere, which will be just, rational, equitable and beneficial to all".

PRC ECONOMIC JOURNAL DISCUSSES SYSTEMS OF GRAIN RATIONING IN COMMUNES

HK120333 Beijing JINGJI GUANLI in Chinese No 7,25 Jul 79 pp 38-39 HK

[Article by Jian Nong [1696 6593]: "How To Ration Grain to Commune Members According to Work Performed"]

[Text] The distribution of grain ration and agricultural products concerns the vital interests of every commune member, a subject the broad masses care very much about. How will this distribution accord with the principle "to each according to his work"? The following article shows the way practiced by the communes and production brigades at Shangyou County in Jiangsi Province.

Reverse the Reversal of Right and Wrong

In the past, as a result of the interference and sabotage by Lin Biao and the gang of four, it was difficult to carry out the principle of distribution "to each according to work." Having carried on an ultraleftist line and propagated egalitarianism, they condemned the distribution of grain ration and material rewards as "enlarging the bourgeois rights," "bringing about polarization" and so forth. Under their pernicious influence, the grain ration of this county was mostly distributed according to classification and the number of people. The commune members got the same rations and same shares regardless of their work performance and fertilizer applied. As a result, those who worked more gained less; those who worked less, gained more and even those who did not work got food to eat as well. The principles of "he who does not work does not eat" and "to each according to his work" were reversed. According to investigation, Yang Meiqian, a commune member of Meishui Commune, has six people in his family, among them two who are able-bodied. The Yangs earned 6,683 workpoints in total by working for the production team and applying fertilizer. They were distributed as many as 3,003 jin of grain rations, while Yang Meicai, another commune member, having the same labor power and same number of people got only 2,951 jin of grain rations, though he had acquired 9,195 workpoints. In comparison with the former, the latter got 2,512 workpoints more but had less food to eat. In addition, the supply of oil, beans, potatoes, millet and other food grains were all provided equally in accordance with

the number of people. A saying among the commune members goes, "The collective supports the parents and children and rations grain according to the number of people and classification; however, tiny bags of grain await the workers who perform well while bigger baskets of grain fall to the idlers."

By criticizing the ultraleftist trend of thought, the commune members could afford to distinguish clearly between right and wrong. "By attacking the principle of 'to each according to his work,' Lin Biao and the 'gang of four' tried to encourage laziness, discourage industry and disrupt the development of the productive forces," said the commune members. They came to realize that the implementation of "to each according to his work" was decided by the objective laws of economy. Only by applying the principle of payment received according to quantity and quality of jobs, more pay for more work and less pay for less work can the working enthusiasm of the laborers be stimulated and the development of production be promoted. Otherwise, it will dampen the working people's enthusiasm and hamper the rapid growth of production. It is imperative to implement the principles of "to each according to his work" in the distribution of grain rations.

#### Comparison of Some Systems of Grain Rationing

While implementing the principle of "to each according to his work," the county made a careful investigation, summed up the experience and singled out various systems for study and discussion.

1. Classifying grain rations, distributing equally. This means classification according to labor power and distribution of grain rations according to age.
2. Classifying grain rations with special consideration for the aged and the young. This means rationing grain according to classification of labor power with fixed rations for the aged and the young. Some 30 to 50 percent of the fixed labor power grain rations is used as labor grain distribution, 3 to 5 percent of the total grain ration is used as fertilizer workpoint distribution. This system has been in practice for many years.
3. Fixing grain ration value for workpoints. This means fixing each work day (including workpoints for applying fertilizer) at half a jin or one jin of grain and so forth, while rationing the rest according to classification and number of people.
4. Fixing the basic grain ration, distributing the rest according to work performed. The grain ration of the previous year is generally taken as a basic figure. After providing for reserves and over-quota sales to the state, increased grain output is distributed according to workpoints.
5. Basic grain ration plus distribution according to work performed. Basic grain rations account for 60 to 80 percent of the total grain rations; the other 20 to 40 percent is distributed according to work performed.



There are advantages and disadvantages among these five systems.

The first system is considered to be nothing but egalitarianism. It is inadvisable to adopt such a system.

The second one is not entirely fair. First, it is disadvantageous to the implementation of the principle of "from each according to his ability" and the mobilization of positive factors. A fixed amount of grain is rationed regardless of age. People who take part in physical labor are not given more to eat. Thus, some are unwilling to work in the production teams and others ask to be given grain rations for the aged and the young. Grain rations with special consideration to the old and young insures that commune members get enough grain to eat. Consequently, everyone is busy with his private affairs. Secondly, this system is disadvantageous in remolding the idlers and those who cheat. Since everyone in the family is assured of his ration, the family's livelihood will not be affected even if the working hands do not work for the collective. Thirdly, it is harmful to unity. Everyone knows very well in his heart the percentage taken out of grain ration and distributed. So it causes a misunderstanding called "workpoints seizing grain" and "fertilizer-points seizing grain." Quarrels and disputes have erupted as well. This has made the members who have gotten more grain feel uneasy. In addition, the calculation is very troublesome and complicated. The workpoints and fertilizer-points cannot be calculated separately from the workpoints earned by the old and the young.

Many communes and production brigades hold that there are more advantageous factors in the third, fourth and fifth systems. These systems conform to the spirit of the New Constitution and the newly revised 60 points. All workpoints earned by performing labor, applying fertilizer and earned by the old and the young are taken as a whole for distribution. This system of distribution is beneficial to mobilizing every positive factor. It embodies the principle of more pay for more work, less pay for less work and "he who does not work, shall not eat." The collective and individual interests are combined together. The more you work and the more fertilizer you apply, the more you get to eat and the more is available for distribution. Moreover, the way of calculation is simpler and it is easier for the commune members to accept such a calculation.

[HK120336] After Implementing the Policy of Grain Distribution According to Work Performed

Only by comparing, can one distinguish. The communes and production brigades of this county have generally adopted the fifth system of grain distribution through centralism on the basis of democracy, taking 60 to 80 percent of the grain rations as the basis for classification, and distributing the other 20 to 40 percent according to work performed. So is the rationing of other agricultural products such as oil, beans and potatoes. At Anho, Zhongxiao, Huang Sha and other communes, they work out the income distribution plan in a democratic way by perfecting regulations on workpoints, fertilizer-points and the system of rewards and penalties. Thus, the program is "known a year in advance."

As soon as the policy of distribution "to each according to his work" is implemented, the enthusiasm to work for the collective soars to unprecedented heights. In the past, the cadres used to ring bells urging the commune members to work, but now the commune members urge the cadres to assign them jobs instead. Those who earlier asked to be given grain rations for the aged and the young have taken part in the collective labor according to their ability. The communes and production brigades everywhere are busy with spring plowing, preparation for plowing and sowing and manure collection. The commune members have said happily: "The implementation of the policy warms the hearts of the people. Eating more or eating less depends on the attendance of work. When you overfulfil production quotas you get more pay and more distribution."

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RESEARCH ON EFFECTS OF COLD WEATHER ON RICE IN JAPAN

Beijing QIXIANG /METEOROLOGY/ in Chinese No 3, Mar 79 pp 13-15, 17

/Article by Qi Laifu /8016 0171 4395/: "General Survey on Research Efforts on the Damaging Effects of Cold Weather on Rice Crops in Japan and other Countries"/

/Text/ Today, rice crops suffer from cold weather damage not only in such temperate zone countries as Japan, South Korea and the United States, but also in such tropical zone countries as Sri Lanka, India and Indonesia. Thus, rural meteorologists in every country, especially Japan, are conducting many kinds of research studies on this problem. Following is a brief survey on some of their achievements.

I. Types of Cold Damage and Their Characteristics

Based on the effects of low temperature on crop production and the time of their occurrences, the Japanese have classified cold damages into two broad types: the delay type and the impediment type.

When crops are adversely affected by prolonged low temperature weather during their vegetative growth period, their growth is delayed, resulting in poor maturation and lower yield. This is called delay type cold injury. Its main characteristics are: low germination percentage, slow seedling growth rate, and late earing and blossoming. Although fertilization is normal, the short growth period causes insufficient filling and ripening, excessive half-filled grains, and low 1,000-grain weight.

During the reproductive growth period, if cold weather occurs in the meiosis stage of the pollen mother cells, especially in the microsporulation or meiosis leptotene stage, the physiological mechanism of the reproductive organs is ruined, causing decreased yields resulting from barren spikelets and increased percentage of empty grains. This is called impediment type cold injury. Its main characteristics are: (1) the pollen and blastula mother cells are split up and ruined; the chromosomes are separated during the meiosis period, the cell wall formation is ruined following the meiosis period; the tissues of the ruined pollen tapetum become swollen. (2) The anthers stop

growing; the pollen cannot mature; only parts of the anther chambers can open, or none of the chambers can open at all; the pollen particles remain in the anther chambers; very few or none of the pollen particles fall on the stigma; pollen particles which have fallen on the stigma have lost their germination capacity. (3) The percentage of grain with no germination potential is especially great.

When cold weather strikes in the initial growth period, the growth and earing of the crops are delayed. Moreover, during the meiosis period, especially during the microsporulation period, the cold injury causes some of the spikelets to become barren, and maturation is delayed, thus producing large quantities of empty grain husks. This is known as the mixed type cold injury or syndrome type cold injury. Besides, in cold rainy summer years, the rice blast disease often erupts and aggravates the effect of low temperature on rice yield. This is the so-called rice blast cold injury.

## II. Main Causes of Cold Damage

### 1. Meteorological Aspect

In foreign countries, analyses is mostly based on the relationship between such factors as atmospheric circulation, sunspots, sea temperature, etc. There are also research studies on the law of climatic changes.

In the article "The Cooling of Climatic and Rice Planting Techniques", Yasoji Tsuboi pointed out that the worldwide climatic anomaly is closely related to the cooling of the climate in high latitudinal regions. When the arctic cold current is weak but stable, the westerly belt is located in the northern portion of the middle latitudinal region. This is known as high latitudinal east-west current type. When the arctic cold current strengthens, the westerly belt is located in the southern portion of the middle latitudinal region; the cold area expands and stabilizes. This is called low latitudinal east-west current type. As the cooling of the climate increases, the cold currents drift southwards. The warm currents move northwards, and relatively strong northward fluctuations occur in the westerly wind zone. This is called south-north current type. It is an unstable condition which appears during the transitional stage from the warm period to the cold period. When the south-north current type predominates, Japan is often hit by cold calamities. He believes that we are now experiencing a period in which the south-north current frequently prevails. How long will this period last? When will it change into the stable cold type? When the cold period comes, how cold will it be? Today there are different views on these questions. In 1973, the Japanese Meteorological Department disclosed the following viewpoint: When the south-north current prevails, cold climate is likely to strike the whole of Japan or some parts of the country. Moreover, cold summer climate occurs primarily in the northern and eastern parts of Japan. In 1974, the meteorological department believed that it was difficult to predict to what degree the current cooling trend would develop to. If it continues for more than 10 years, it is likely that a climate similar to the cold period prior to the 19th Century may



occur. Thus, in 1975, the Japanese Government decide to carry out the "Research Project on Finding Combined Technical Measures to Cope with the Anomalous Climate" in 1976-1980. If the annual mean air temperature drops 1 degree Centigrade, the frost free period will decrease by 10-14 days; due to the low temperatures, the growth period of farm crops will be prolonged 7-11 days, and the effective vegetative growth season will decrease by 17-25 days.

According to the studies made by Satake and his associates, during the 88-year period from 1883 through 1971, Japan suffered 22 cold damage years; the average reoccurrence cycle was 4 years.

In Japan, a cold damage year can be divided into three low temperature periods: June-July, August-September and the entire summer season. The air temperature negative anomaly is 1-2 degrees Centigrade. Based on atmospheric pressure conditions, the occurrence of cold damage in Japan is related to the location of the Okhotsk high pressure. When the Okhotsk Sea high pressure appears in the northern part of Japan, it frequently gives rise to cold damage years. If the Okhotsk high pressure is strong and the Pacific high pressure is weak, and the year is characterised by slow northward moving current, or over-early southward drift of the climax, then it is likely to be a cold damage year.

## 2. Agricultural Aspect

The expansion of the rice cold injury area over the past year, is related to the inappropriate introduction of new varieties and improper multiple cropping. Due to the expansion of rice production, the rice planting area has quickly extended to high mountain and cooler regions. Besides, new farming methods have been introduced into warm areas located in the southwestern part of Japan--including the early rice planting method (i.e. double crop rice). Although the new measures have helped to increase the crop yield, the cold damage problem has become even worse, and in the last decade, cold damage has occurred all over Japan.

According to Kaneda's 1972 survey, cold damage has also hit Australia, Bangladesk, Sri Lanka, Columbia, India, Kashmir, Nepal, Pakistan, Peru, the United States, Indonesia and South Korea. Owen /phonetic/ believes that in tropical areas, rice crops utilize the monsoon rain. They are strong monsoon photosensitive varieties which can only be planted during the rainy season. Although their growth period is long, their temperature requirements are not so high. Thanks to the construction of water reservoirs and the popularization of non-photosensitive high yield varieties over the past decade, it is now possible to plant rice in dry seasons as well. There are two planting seasons in a year, and vegetative growth season has increased considerably. As the water reservoirs are quite large, the water which is used to irrigate the paddies comes from the cold depths of the reservoirs, thus causing the rice cold injury problem to become relatively acute.

Besides, the degree of cold damage is related to a number of factors such as occurrence time, degree and number of consecutive days of the cold temperature climate, exposure to sunlight, type of varieties, soil, fertilizers, cultivation management, etc.

### III. Research on the Impediment Type Cold Injury

#### 1. Low Temperature Sensitive Period

In 1970, Sataka suggested that the low temperature sensitive period of rice crops in the microsporulation stage should be divided into 4 to 1 contraction periods. He also discovered another sensitive period which occurs prior to the meiosis Leptotene stage and during the early leptotene stage.

#### 2. Critical Low Temperature

In the early 1940's, the following was discovered: When rice plants were exposed to 17 degrees Centigrade for 6 days, the sterility rate rose sharply; but when they were exposed to 20 degrees Centigrade for 10 days, the sterility rate dropped. In 1949, Sakai proved that at air temperatures below 15 degrees Centigrade, sterility was primarily caused by meiosis anomaly and the swelling of tapetum cells. In 1969, Nishiyama and his associates suggested that the critical temperature leading to the sterility of winterhardiness varieties which have strong cold resistance should be 15-17 degrees Centigrade, and the critical temperature of low-temperature sensitive varieties should be 17-19 degrees Centigrade. Based on his judgement, it appears that the sterility occurrence temperature is 15-20 degrees Centigrade. Tatsuo Uchijima believes that besides the degree of low temperature, the number of empty kernels are also related to such factors as the duration of low temperature, the diurnal range of the atmospheric temperature, and the growth conditions before and after the ear forming stage. In 1958, Matsushima studied the effects of various combinations of day and night temperatures on sterility by using the day and night temperature control method during the meiosis period. The results indicated that under round-the-clock constant low temperature conditions, the sterility rate was very high; but the sterility was very low under high day temperature and low night temperature conditions. In 1974, Boilma /phonetic/ pointed out that if the air temperature fell below 15 degrees Centigrade, during the meiosis period, it could cause the sterile spikelet rate to increase, thus reducing the yield. This particular effect is enhanced when rich nitrogen fertilizers are applied.

#### 3. Injured Organs

Sakai has discovered that rice sterility varies with different levels of irrigation water. Generally, when the irrigation water is 15 cm deep, the sterility rate is greatly reduced as compared against 5 cm of irrigation water. He believes that when the panicles are submerged in water during the sensitive period, they are protected against the injurious effects of low temperature. If cold water is used during the sensitive period of panicles, sterility is likely to occur. On the other hand, if warm water is used to protect the panicles, even if the other organs are exposed to low air temperatures, fertile panicles can still develop. This indicates that among the various organs, panicles are sensitive to low temperature.

It is widely believed that the growth of the interior glume is not impaired by low temperature conditions. Thus, sterility must be caused by either the pistil or stamen, or both of these organs. Sakai believes that sterility is caused primarily by stamen anomaly. But he also suggests that a spikelet has six anthers which can produce 5,000 - 7,000 pollen particles. If 10 or more pollen particles on the stigma can germinate, fertilization is expected to occur. In 1969, when Hayase and his colleagues pollinated rice plants affected by low temperature with healthy pollen grains, they discovered very high percentage of fertilization, which proved that sterility was primarily caused by pollen anomaly. In 1970, Ito and his associates attributed the direct cause of rice crop sterility to the inadequate splitting of anthers. In 1970, through research efforts, Satake proved that the application of low temperature treatment during the meiosis period could delay the growth of husk interior, but it had no influence on the final length; low temperature exposures not only reduce the dry weight of all the anthers but their protein, nitrogen, phosphate contents as well. It also reduces the respiration function of the anthers. The reduction rate of the preceding contents coincides with the reduction rate of fertilization. In normal anthers, proline occupies the greatest percentage of all amino acids. Based on Ito's 1972 calculations, in anthers exposed to low temperature during the meiosis stage, almost every type of amino acid will reduce; the reduction is even greater especially when proline accounts for over 40 percent of the total amino acid contents in the anthers of normal rice crops. But, perversely, the increase in asparagine contents can cause damage to the anthers.

#### 4. The Mechanism of Sterility

On the first day following the application of cold temperature treatment, microscopic anomalous phenomena can be observed in anthers chambers. Sakai believes that the swelling rate of the tapetum tissues is the main cause of sterility. In 1970, Hayase and Satake conducted cytological observations on the pollen growth of rice plants which had been cooled during the meiosis period. They discovered that the percentage of anomalous microspores appearing in the quadrantal stage was much less than that observed by Sakai. In 1970, Nishiyama and his associates also found that the percentage of swollen tapetum tissues was not as high as the percentage of sterility. They believed that the swelling of the tapetum tissues was not the chief cause of sterility. This problem needs to be further studied. Recently, Satake pointed out that when low temperature treatment is applied during the microsporic period, microsporic anomaly in anthers occurs 4 days after the treatment, but bubblelike swelling of the tapetum tissues occurs 2 days after the treatment. Thus, the anomaly of microsporic growth indicates that there is an obstruction of nutrients which reach the microspores through the tapetum tissues. Based on cytoplasm, it has been determined that tapetum cells not only serve as nutrient passages, but also have metabolic activity. Once this type of metabolic system is impaired, the cellular nutrient supply could be cut off. At present, there is no ample evidence verifying that microsporic or tapetum cells (or both) are the most sensitive tissues to low temperature. Even if the obstruction of nutrient flow is the cause of sterility, it could have resulted chiefly from the cessation of nutrient flow to the microspores.



In 1970, Nishiyama made numerous electron microscopic observations to study the mechanism of swollen tapetum tissues. He pointed out that the bulges on the transverse sections of the swollen tapetum tissues had resulted from the fusion of several tapetum cells caused by the breakdown of the walls between the tapetum cells. When the walls are first damaged, nearly all of the cellular tissue organs in the fused cells are still normal. The nuclei of the enlarged and swollen tapetum cells go through amoeboid changes; the endoplasmic reticular tissues become bulged; and there are still traces of damaged cell walls and cell membranes. There seems to be no morphological changes in the mitochondria, protoplasm and other cellular components. But their numbers have greatly increased. It is believed that the destruction of tapetum cell walls is caused by the anomalous accumulation of reduction substances (mainly reductase) in the tapetum cells of anthers. In 1970, Nishiyama summed up the causality relationship between low temperature and sterility as follows: Under the influence of low temperature, the tapetum tissues swell, i.e. preliminary and intermediate anomaly occurs in the cells of micropores of tapetum tissues, which leads to the poor growth of microspores and pollens, thus preventing the anthers from splitting, and finally giving rise to sterility.

#### IV. Study on Delay Type Cold Injury

##### 1. The Relationship Between Heading Delay and Temperature

According to the International Rice Research Institute's 1972 report, the effect of temperature on the mean relative growth rate of rice seedlings is more acute in the first 3 weeks after the sowing than in the fourth week. At 55 degrees Centigrade, a new leaf emerges every 5.4 days; but at 31 degrees Centigrade, a new leaf appears every 3.5 days. In the 1st, 2nd and 3rd week of its growth, the ratio of dry substances produced by International Rice No 8 seedlings through photosynthesis is 30 percent, 84 percent and 100 percent respectively. From 3 to 5 weeks after the sowing, the average relative growth rates of each plant per week at 22, 25, 28 and 31 degrees Centigrade are 1.40, 1.56, 1.6 and 1.62 grams respectively. It is believed that 22 degrees Centigrade is best for early vegetative growth. Although high temperatures help to promote tillering, the number of spikelets per spike is correspondingly reduced. Relatively speaking, the number of spikelets produced at 25 degrees, 28 degrees and 31 degrees Centigrade are 83 percent, 76 percent and 58 percent of the number of spikelets produced at 22 degrees. In 1974, Yasushe transplanted rice seedlings of the Nonglin No 17 variety which had reached the 8.2 leaf stage, to an artificially controlled environment, in which the day/night temperatures were 35 degrees/30 degrees, 30 degrees/25 degrees, 20 degrees/15 degrees and 15 degrees/10 degrees Centigrade, and the sun exposure was 14 hours and 9 hours. When the plants reached the 13.2 foliage stage, he made some sampling tests. The result was as follows: The growth rate of the leaves reduced with the temperature drop; when the day/night temperature was 25 degrees/20 degrees Centigrade the plants reached maximum height. The height and tillering of the crops under long light exposure conditions exceeded those under short exposure conditions. According to Yoshida's research finding of 1973, in North Palmerston, New Zealand, the



following varieties were placed under day/night temperature conditions of 26 degrees/18 degrees, 29 degrees/21 degrees, 32 degrees/24 degrees, and 35 degrees/27 degrees Centigrade respectively: Guoji Dao No 8, Taizhong Bendi No 1, Huangjin and Ka Fr Luo Sai /a European variety, Carlos in phonetics<sup>7</sup>. Under 12 hours of controlled temperature environment, the higher temperatures stimulated foliage growth and tillering. The temperature environment not only influenced the growth of dry substances, but also the differentiation of varieties. Within a week's time following the sowing, the temperature influence on the vegetative growth rate was most striking. As time moved on, the influence gradually decreased. According to Ito's introduction in 1975, the greening temperature range of rice is 16-30 degrees Centigrade; the most suitable temperature is 25-30 degrees Centigrade; the greening is affected below 16 degrees Centigrade. The critical temperature for dry seedling greening is 13.5 degrees Centigrade. The hot-bed temperature for wet seedling is 14.5 degrees Centigrade; water seedling 15 degrees Centigrade; soiled seedling 12 degrees Centigrade. When the tillering stage begins, the suitable temperature is approximately 30 degrees Centigrade; the elongation growth of seedlings is inhibited at temperatures below 17 degrees Centigrade, and the minimum critical temperature for the seedling elongation growth is 15-16 degrees Centigrade. The critical temperature of tillering is 12-13 degrees Centigrade. High temperature conditions prior to the young spike differentiation stage can stimulate the differentiation of the first bud or cause spike differentiation to occur ahead of time. The aseptic culture method has been used to probe into the affects of temperature on rice spike differentiation, and the test tube results indicate that when the culture liquid temperature ranges from 20 to 30 degrees Centigrade, there is no difference in the rate of spike differentiation. But when the culture temperature is below 15 degrees Centigrade, the spike differentiation is impeded; the impediment is especially acute at temperatures below 10 degrees Centigrade; under such conditions, the growth of young spikes is basically at a standstill. It is generally believed that the critical temperature of spike differentiation is 15-18 degrees Centigrade. Besides temperature conditions, the differentiation of young spikes on rice plants is also greatly affected by light exposure conditions.

The differentiation of spikelets requires relatively high temperature conditions. The suitable temperature range is 30 to 32 degrees Centigrade. To prevent the degeneration of spikelets, the proper temperature during the daytime should be 36 degrees Centigrade, and at night it should be 21 degrees Centigrade. During the filling stage, daytime temperatures should be set at 31 to 32 degrees Centigrade, and night temperatures are 20-21 degrees Centigrade. The optimum day and night temperature for heading is 31 degrees Centigrade. The critical temperature which affects the empty husk percentage of strong winterhardy varieties is 15-17 degrees Centigrade, and 17-19 degrees Centigrade for weak cold-resistant varieties.

As the crops approach the heading and blooming stages, the influence of low temperature over heading delay and empty husk occurrence gradually weakens. But during the flowering period, low temperature will inhibit the blossoming,

and cause flowering and fertilization to be delayed; both heading and ripening are delayed. Moreover, owing to the temperature drop, during the filling stage, the milking is poor. The suitable temperature for the blooming stage is approximately 30 degrees Centigrade; the lower limit is 15 degrees Centigrade; the crops can not blossom normally below 15 degrees Centigrade. The critical temperature for fertilization is 16-17 degrees Centigrade. For totally normal fertilization, the temperature should be above 20 degrees Centigrade.

Regarding the most sensitive period of low temperature delayed heading, from the test results of temperature responses at various stages of growth, it is evident that low temperatures at the greening stage has the greatest influence over delayed heading; the second most sensitive period is from the leaving transformation stage to the initial spike differentiation stage; the third is from the initial spike differentiation stage to the heading stage. The lower the greening temperature is, the longer the heading delay becomes; the young seedlings are delayed longer than the adult seedlings; and the delay period of medium seedlings is somewhere in between.

## 2. The Relationship between Filling and Temperature

When low temperature conditions ranging from 11-20 degrees Centigrade occur during the filling-ripening stage, although the ripening is delayed, if the conditions begin to improve in the late stage, normal ripening could result in the end. In low temperature years, if the crops are hit by severe frost-bite before they fully mature, the growth of kernels is discontinued, resulting in the delay type cold injury.

According to Tanaka's 1976 research, the most suitable temperature for the filling stage is above 22 degrees Centigrade; the lower the temperature is, the less 1,000 - grain weight is produced. If the air temperature is below 20 degrees Centigrade during the milking stage, rice grains with specific weights over 1.13 will gradually be reduced; at 18 degrees Centigrade, although the increase in blighted grains is not great, rice grains with specific weights over 1.13 will be reduced by approximately 50 percent. When the filling stage air temperature is 16-17 degrees Centigrade, although the fructification percentage is 60 percent, there are hardly any rice grains whose specific weights exceed 1.07.

Under ordinary circumstances, the embryo growth of rice crops is consummated 10 days after the fertilization stage; the rice grains reach maximum length in about 7-10 days; maximum width is reached in 9-12 days; and the width is consolidated a couple of days later. Besides, approximately on the 3rd day following the fertilization, starch particles begin to accumulate in the endosperm tissues, and the accumulation ends around the 30th day. Thus, the growth rate of the rice grains becomes fastest about 15 days following the blooming stage, which is the period when low temperatures exert the greatest influence, especially in the previous 5-6 days.

Besides temperature, sunlight exposure also has great influence. Matsushima believes that during the meiosis stage, inadequate light exposure reduces the number of grains, and if the crops do not get enough sunlight during the climax of the filling stage, both fructification and 1,000 - grain weight are reduced.

## V. Preventive Measures

There are a lot of factors leading to low temperature injury. There are also quite a few ways of prevention which can be summed up as follows:

1. From the meteorological approach, first of all, it is necessary to understand the region's climatic features and law of variations. Next, find out what kind of climatic conditions are required by the crops and their varieties, and map out the crop climatic regions. In order to prevent cold injuries, the crops should be properly distributed in accordance with local conditions. Uchijima's agroclimatic classification of Japanese rice crop regions was made by evaluating rice cultivation conditions based on such agroclimatic resources as water and heat. His thermal index was based on the accumulation temperature of paddy water above 10 degrees Centigrade, and four rice regions were classified as follows: cold (below 3,000 degrees Centigrade), cool (300-4,000 degrees Centigrade), warm (4,000-5,000 degrees Centigrade), and double cropping regions. The regionalization indice varied according to the characteristics of the regional climate as well as crops and varieties; some were determined by the guarantee rate of 75 percent, some by 80 percent, and (Handing)/phonetics/, an American, believes that there is need to have 100 percent guarantee rate against low temperature cold damage.

2. From the agricultural point of view, first of all, it is necessary to cultivate winterhardy early-maturing high yield varieties, so as to reduce the damage incurred from cold injury. In order to improve the winterhardiness of varieties bred in the cold regions, the Japanese generally use the hybridization method to cross breed winterhardy mother plant varieties with superior varieties which are extensively used today. While accelerating the reproduction of generations, efforts are also being made to determine the winterhardiness of new varieties by combining the method of field irrigation by channeling cold water along furrows with the application of artificial climate houses. Today, a large number of relatively strong winterhardy varieties have been developed.

3. The use of plastic film arched canopies to maintained optimum temperature for dry crop seedling growth: This is an important method for cultivating rice crops in high and cold regions. Dry seedlings are relatively short and hard; they have low water contents but high contents of nitrogen and carbon. Moreover, they are resistant to drought and cold climate, and are suitable for early cropping. Following transplantation, there is hardly any delay in seedling growth, and the early tillering ability is very high. The use of films for maintaining hot-bed dry seedling growth also enables early sowing; as a

result, the ripening period of medium maturing varieties is earlier than the ripening period of extremely early maturing varieties under ordinary cultivating conditions.

4. Enhance farm capital construction, improve environmental conditions, build wind shelter forests and windbreaks. In regions threatened by cold calamities, early, medium and late maturing varieties which give relatively stable yields or high yields should be used in proper proportions; but early and medium maturing varieties should be used as the main crops. This is an effective means of reducing cold injuries.

In certain years, or in times when forecasts are inaccurate, or when the climate is abnormal, cold damage is inevitable. Under such circumstances, it is necessary to adopt emergency measures, such as the combustion heating method, fumigation method, blowing method, foaming method, flooding method, etc.

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## EFFECT OF HARDNESS OF PADDY SOIL STUDIED

Beijing TURANG XUEBAO [ACTA PEDOLOGICA SINICA] in Chinese Feb 79 pp 70-74

[Article by Cheng Yunsheng [4453 0061 3932], Lin Changying [2651 7022 5391], Yang Yuanzhang [2799 5373 3864] and Xu Mengxiong [1776 1125 3574] of the Nanjing Pedology Institute, Chinese Academy of Sciences: "Hardness of Paddy Soil and Their Effect\*"]

[Text] Past work (Chen Jiafang [7115 1367 0972] et al, 1961; Cheng Yunsheng [4453 0061 3932]) shows that high yielding paddy rice requires a relatively mushy and soft soil condition for growth during its early growth period while after its middle growth period, the condition of the soil must change from mushy and soft to hardpan. Experiments have shown that when the soil is mushy and soft, mineralization of nutrients is rapid, thus facilitating growth during the tillering stage of paddy rice. The contrary is true when the soil is in a hardpan condition (Cheng Yunsheng [4453 0061 3932], 1965). Adjustment of the hardness of the soil is significant and important as a technique to cultivate high yielding paddy rice. In baking the field, the principle which states that "prosperous seedlings grow in mushy soil" should be adhered to (Cheng Yunsheng [4453 0061 3932], 1963), but baking the field should not be entirely dependent upon the growth periods of paddy rice. Rather, it should be done according to the physical characteristics of the soil and in combination with appropriate measures of irrigation determined by the condition of the seedlings. At the same time, adjustment of the hardness of the soil is also the key to regulating other factors, because during the rice planting seasons, soil with high levels of fertility more readily becomes soft and mushy. Therefore the soil can be cultivated and raked deeper each succeeding year. But the soil must not be raked and harrowed too much to become mushy so that the slow but steady supply of nutrients can reach a stable level. In sidedressing, the soil's supply of nutrients must be kept stable and long lasting, and sidedressing should be done only after the soil's capability to supply nutrients has lessened to avoid plants growing too prosperously. Soil with a low level of fertility does not easily become mushy and soft during the rice planting period but easily settles, solidifies and hardens. Thus, cultivation of the soil must be done shallowly and the soil should be raked finely to

\* Comrade Zhu Minfu [2612 6900 1381] also participated in a portion of the work.

fully spread out the soil to facilitate release of the soil's nutrients for the growth of paddy rice. Since this type of soil provides an abundant amount of nutrients in a short time, the soil should be sidedressed many times but in small amounts every time using chemical fertilizers and the amount of organic fertilizers should be increased so that the soil easily becomes mushy and soft. This is beneficial to satisfying the need for nutrients required in the growth of paddy rice.

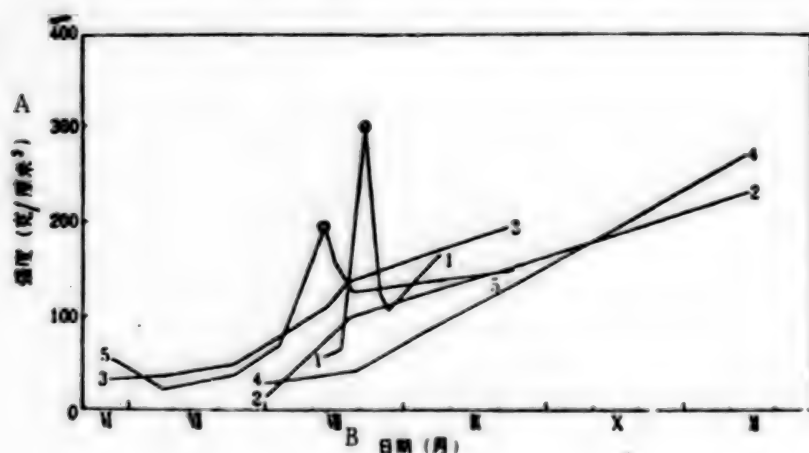


Figure 1. Change in hardness of plowing layer during paddy rice planting period (1962-1963 using the Swedish conical soil hardness measuring instrument, 1964 using the cross plate cutting instrument for measurement)

Key: A. hardness (gram/centimeter<sup>2</sup>) B. Months

- 1--surface submergic middle paddy soil (1963)
- 2--gleyed southern paddy soil (1963)
- 3--gleyed southern paddy soil (1964)
- 4--chestnut soil (1963)
- 5--chestnut soil (1964)
- o--measured prior to reirrigation after baking the field

To investigate the dynamic process of soil conditions of being mushy, soft, hardpan or hard during the planting period of paddy rice, we conducted a joint study of high yielding paddy rice in two separate fields, one in the experimental field of the Nanjing Xiaolinwei Agricultural Science Academy (surface submergic middle paddy soil) and in the high yielding field of the state-run Lianhu Farm in Danyang (chestnut soil and gleyed southern paddy soil) (The basic properties of these three types of soils are expounded in the papers by: Cheng Yunsheng [4453 0061 3932] et al, 1963; Zhao Chengzhai [6392 6134 7872], 1963). The hardness of the plowing layer during the paddy rice planting period was investigated (determinations were

made repeatedly 12-50 times) with the Swedish conical soil strength tester (ref. Povski, 1954) and the cross plate cutting instrument (compiled by the compilation department of the library of the office of the Ministry of Water Conservancy and Power, 1962). The results obtained (Figure 1) showed that during the planting period of paddy rice, the hardness of the soil of the plowing layer gradually increased and was profoundly affected by the management of muddiness and water. When the soil was being drained, the hardness of the soil increased more rapidly than when the soil was being irrigated. The soil reached its highest degree of hardness just prior to reirrigation after baking. The degree of hardness dropped as water was reirrigated but increased as the duration of reirrigation of water lengthened. This observation coincided with that obtained from studying soil capacity during the planting period of paddy rice (Chen Jiafang [7115 1367 0972] et al, 1961; Cheng Yunsheng [4453 0061 3932], 1962; Cheng Yunsheng [4453 0061 3932] et al, 1963).

Past work (Cheng Yunsheng [4453 0061 3932], 1963) also shows that determining the hardness of the soil in the field enables one to understand how soil granules pile up and solidify. This in turn shows the degree of penetration, holding strength and distribution density of the root system of paddy rice. We also made comparisons between plants that were transplanted and those that were not transplanted in high yielding fields of gleyed southern paddy soil and chestnut soil at the state-run Lianhu Farm in an attempt to determine the effect of the paddy rice root system upon the hardness of the soil (cross plate cutting instrument method). The results (Figure 2) showed that the paddy rice root system affected measurements of the hardness of the soil regardless of whether the soil was chestnut soil of heavy texture (light clay) or gleyed southern paddy soil of lighter texture (coarse silt intermediate loam).

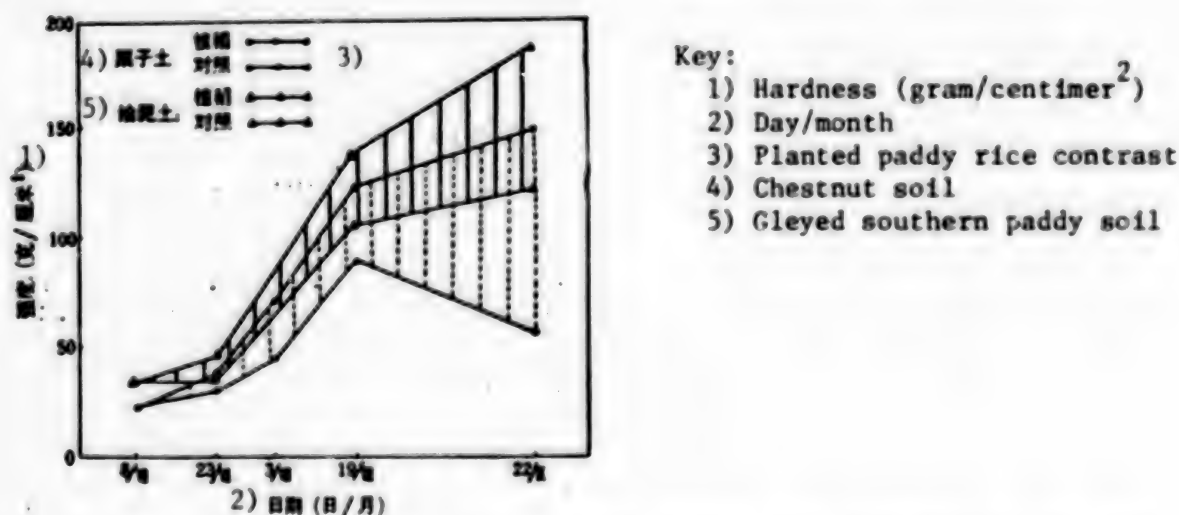


Figure 2. Effect of the paddy rice root system upon hardness of the soil in the field (1964)

Under flooded conditions, the degree of hardness of soil of heavy texture is less than that of soil of lighter texture (Figure 2), probably the result of the difference between the contents of coarse silt granules (0.05-0.01 millimeter) in the different soils (24.4 percent in chestnut soil, 50.2 percent in gleyed southern paddy soil). Since friction among coarser soil granules is higher, the soil is harder. To further explain this relationship, we conducted an experiment on hardness of soils with different granule composition.

For the experiment, the white soil of Wujincaojiao (heavy loam of coarse silt texture with 1.60 percent organic matter) was selected and compared to chestnut soil. Granules  $\leq 0.01$  millimeter were separated by soaking the white soil in still water repeatedly and grouped into 4 samples according to the following ratios: (1) Granules  $> 0.01$  millimeter; (2) granules  $> 0.01 < 0.01$  millimeters mixed in a 2:1 ratio; (3) Granules  $> 0.01 < 0.01$  millimeters mixed in a 1:2 ratio; (4) Granules  $\leq 0.01$  millimeter. Granules  $\leq 0.001$  millimeter of chestnut soil were also separated by the same method and mixed with granules  $> 0.001$  millimeter to form clay granules ( $\leq 0.001$  millimeter) of 5 different percentages in content: 20 percent, 25 percent, 30 percent, 35 percent and 40 percent. The above samples were saturated by water and kept under a water layer 2 to 3 centimeters deep. After 10 days, the hardness of the soil with different water content was determined and the results are illustrated in Figure 3 and Figure 4.

Figure 3 shows that the hardness of the soil increases as the content of physically sandy granules increase ( $> 0.01$  millimeter). It lessens as the water content of the soil increases. The hardness of the soil also changes similarly with different contents of clay granules ( $\leq 0.001$  millimeter). However, the differences are small when the water content of the soil is high (Figure 4). This shows that when the water content of the soil is relatively high, higher than a certain level (between 70 and 75 percent of saturation), draining the soil will not cause any great change in the hardness of the soil. Draining the soil after the water content of the soil has dropped below this range will drastically increase the hardness of the soil. This is a very important point in reasonably controlling water and muddiness management of the paddy rice field.

The amount of organic matter contained in the soil also causes change in the soil's hardness. This is a problem often encountered when the application of fertilizers is determined by observing the soil condition. In addition, the variety and amount of fertilizers being applied also may affect management of water and muddiness of the field and regulation of the soil's fertility. Thus, we conducted laboratory experiments on this question.

The soil's subjected to experiment were fine silt and the gleyed middle paddy soil from the bottom of alluvial fields in the mountainous regions in Jiangning County. Gleyed middle paddy soil contained 24.4 percent clay granules and 2.49 percent organic matter and its texture was coarse silt heavy loam. The fine silt contained 18.6 percent clay granules and 1.88 percent organic matter and its texture was coarse silt intermediate loam.



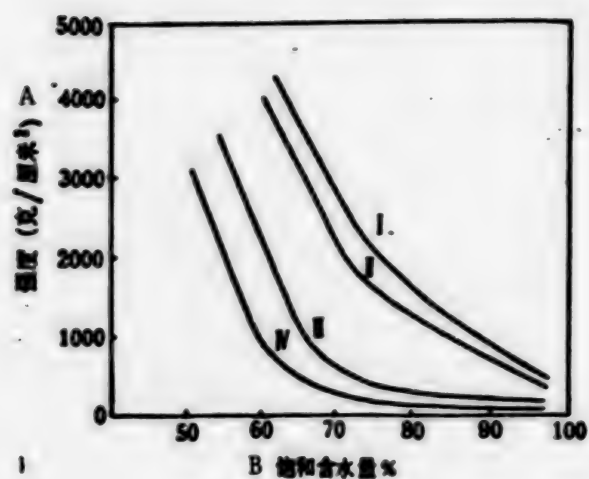


Figure 3. The effect of physical clay granules (or sandy granules) upon hardness of soil (1963)

Key: A. Hardness (gram/centimeter<sup>2</sup>) B. % of saturation

I-- >0.01 millimeter granule; II. >0.01<0.01 millimeter granule (2:1 ratio); III. >0.01<0.01 millimeter granule (1:2 ratio); IV. <0.01 millimeter granule.

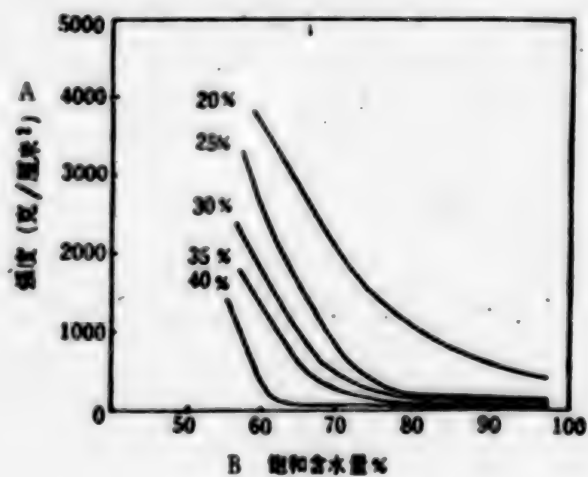


Figure 4. Effect of clay granules upon hardness of soil (1964)

Key: A. Hardness (gram/centimeter<sup>2</sup>) B. % of saturation

To every 100 grams (measured through a syphon of 1 millimeter) of sample soil was added 0.2 grams of crushed astragalus sinicus or hog manure. The mixture was thoroughly stirred in a big water trough (25 x 25 x 100 cubic centimeters) and water was slowly added until saturation. A water layer 2 to 3 centimeters deep was maintained. After 10 days, the change in hardness of the soil was measured regularly (using the cross plate cutting instrument, repeating the measurement 4 times). The entire experiment lasted 100 days. The results are illustrated in Figure 5.

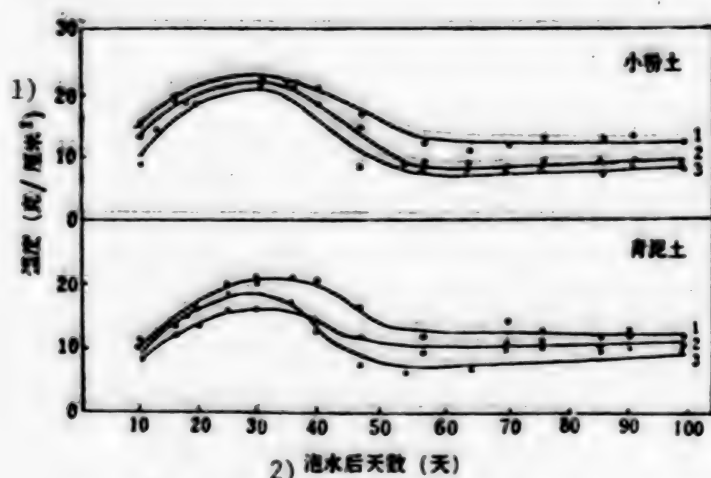


图5 有机肥料对土壤强度的影响(1964)

- 3) 小粉土: 1--对照, 平均含水量 59.8%; 2--加紫云英, 平均含水量 61.8%;  
3--加猪厩肥, 平均含水量 58.1%。  
4) 青泥土: 1--对照, 平均含水量 59.9%; 2--加紫云英, 平均含水量 64.9%;  
3--加猪厩肥, 平均含水量 59.6%。

Figure 5. Effect of organic fertilizers upon hardness of soil (1964)

Key:

- 1) Hardness (gram/centimeter<sup>2</sup>)  
2) Number of days after soaking in water (days)  
3) Fine silt: 1--contrast, average water content 59.8%;  
2--astragalus sinicus added, average water content 61.8%;  
3--hog manure added, average water content 58.1%.  
4) Gleyed middle paddy soil:  
1--contrast, average water content 59.9%;  
2--astragalus sinicus added, average water content 64.9%;  
3--hog manure added, average water content 59.6%.

It can be seen from Figure 5 that in the treatment of the two types of soils, the hardness of the soil changes according to the change in the duration of soaking in water. Three stages of change are obvious. After soaking in water for 1 month, the hardness of the soil gradually increases and then gradually lessens and approaches that at the beginning period of soaking. There is almost no change after soaking for 2 months. This regular pattern of change is probably due to sedimentation and solidification of the fine soil after soaking in water and the attraction of the water molecules causes the soil granules to gel slowly, thus increasing the hardness of the soil. As hydration causes the water membrane of the soil's granules to thicken and intensify the reduction process and fully disperse the soil granules, the hardness of the soil gradually lessens until no further change occurs.

The results of adding organic matter show that all additions of different organic matter reduce the hardness of the soil. After organic matter has been decomposed by microorganisms, the final product contains a large amount of gases (such as carbon dioxide, methane). Movement of these gases softens the soil to a certain extent. At the same time, decomposition of organic matter intensifies the reduction process and helps the soil to become mushy and soft. It seems that a close relationship undoubtedly exists between the application of organic fertilizers and changes in hardness of high yielding paddy soil as well as the resulting change in the supply of nutrients.

Similarly, soils of different textures undergo different changes in their hardness. Fine silt (intermediate loam) which has a lighter texture is harder than gleyed middle paddy soil (heavy loam) which has a stickier texture.

The following conclusions can thus be drawn from the experiments described above:

1. The dynamic process of paddy rice soil being mushy, soft, hardpan and hard can be indicated by the soil's hardness. The soil's hardness is visibly affected by the growing density of the root system (latter period of growth of paddy rice).
2. The hardness of paddy soil is profoundly affected by the texture of the soil, growth of the root system of the paddy rice plants, the content of organic matter and the amount of organic matter newly added to the soil. Also, the effect of soil texture is greater than the presence of organic matter.
3. After irrigating loose soil, the hardening process of the soil can be clearly divided into three stages of increased hardness, reduced hardness and stable hardness.

VIRGIN FOREST DISCOVERED IN ZHEJIZNG

Hong Kong WEN WEI PO in Chinese 9 Oct 79 p 6

[Unsigned article: "Rare Virgin Forest Discovered in Zhejiang"]

[Text] NCNA, Hangzhou 8 Oct--A rare virgin forest of about 40,000 acres was discovered in the area of Jiulong [0046 7893] mountain, Suichang [6659 2490] county in the mountainous area of southern Zhejiang province. Recently, a Botanical Resources Investigation Team of scientific personnel from the Shanghai Teachers College and the Zhejiang Forestry Research Institute carried out a preliminary study of this virgin forest.

According to preliminary statistics, this virgin forest contains over one thousand species of over 150 families of botanical specimens. Many of these botanical types are quite rare. Among them are a number of valuable and fast-growing types of trees rare both in China and the rest of the world. There also are many rare and valuable medicinal plants.

During the course of the study, not only were the usual animals and reptiles discovered, moreover traces of the activity and resting places of higher primates were also discovered.

The discovery of this virgin forest is of significance to the scientists investigating the changes in geography and climate since the last ice ages.

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CSO: 4007



LIVESTOCK LOST DUE TO COLD WEATHER

Beijing RENMIN RIBAO in Chinese 6 Sep 79 p 2

[Article by Tian Chou [3944 3985, Farmland]: "'Repair the Pen' After 'the Sheep Are Lost'"]

[Text] "Dependence on heaven in the raising of livestock" is currently still very much in evidence. In some livestock areas, about 70 percent of the dams are without pens or sheds. They live in the open air and when wind and snow suddenly strike, a large number of them perish. Each year those areas "express concern" to the state and request "special funds to fight disaster and protect the cattle," but once the funds come to hand they are not used to "prevent concern" by building pens and sheds but become emergency relief funds. Once they have been spent, the people muddle through somehow. Take last year, for example, when the disaster prevention fund amounted to more than 40 percent of the total sum invested in the livestock industry. The local herdsmen criticized by saying: This is "buying a coffin when you have money, but treating illness when you have none."

According to an old adage, "repair the pen after the sheep are lost." Inasmuch as the main reason that livestock suffer catastrophe is lack of proper conditions for wintering over, the special funds should be used in this critical area. Ideas about "depending on heaven to raise livestock" have to change and reliance on emergency relief is an idea that has to be changed too. The lessons learned from "lost sheep" must be changed into the reality of "repaired pens."

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HYBRID WATER BUFFALO BRED IN GUANGXI

HONG KONG WEN WEI PO in Chinese 9 Oct 79 p 6

[Unsigned article: "Three Variety Crossbreeding of Water Buffalo in Guangxi"]

[Text] NCNA, Naning, 8 Oct--The scientific and technical personnel at various units of the Guangxi Zhuang Autonomous Region Livestock Research Institute carried out experiments in contrastive crossbreeding among one type of native water buffalo and two foreign types of water buffalo and bred a type of water buffalo with both excellent milk and beef characteristics. The superior characteristics of this three-parent hybrid water buffalo are: high quantity milk production, good quality milk and beef, rapid growth, and use of coarse fodder. Experiments have determined that in a single milk giving period (generally 300 days) this water buffalo gives about 1500 kilograms, the highest daily milk production reaching 12.1 kilograms. The fat content of the milk is 7.73 per cent, more than twice that of the famous Holstein cattle. The protein content is 5.5 per cent, 1.8 per cent higher than that of the Holstein. This type of water buffalo grows comparatively quickly and at 18 months has an average gross weight of 435 kilograms, which is heavier than any of its three parent types at a comparable age raised on coarse fodder. Slaughter of an 18 month old water buffalo of this type yields 180 kilograms of meat; moreover, the protein content of this meat is about the same as that of cattle, though the fat content is lower. This low fat, high protein meat is welcomed on the international market.

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BRIEFS

**GUANGDONG INTERNATIONAL RICE FORUM**--The international paddy rice research forum jointly held by the China Agricultural Scientific Institute and the International Paddy Rice Research Institute was convened in Guangzhou from 22 to 26 October. The participants discussed plans for cooperation in research. Attending the forum were agricultural scientists from various countries including Bangladesh, India, Indonesia, Sri Lanka and Thailand. Also present were agricultural scientists from Guangdong, Guangxi, Hunan, Fujian, Zhejiang, Jiangsu, Shanghai and Nanjing. (He Guangwen), vice president of the China Agricultural Scientific Institute, gave a speech at the opening ceremony, welcoming the agricultural scientists from abroad. The participants also exchanged their experiences in rice production. The Chinese agricultural scientists at the forum will take part in the international rice experiments to be organized by the International Paddy Rice Research Institute next year. On the evening of 22 October, Xue Guangjun, vice chairman of the Guangdong Provincial Revolutionary Committee, met and hosted a banquet for the participants. [Guangzhou Guangdong Provincial Service in Mandarin 1130 GMT 29 Oct 79 HK] Guangzhou, November 1--Foreign scientists attending the international symposium on rice research in Guangzhou, jointly sponsored by the Chinese Academy of Agricultural Sciences and the International Rice Research Institute, left this South China city for home yesterday. The symposium was held in Guangzhou from October 22 to 26 as part of the programme for international rice research cooperation financed by the U.N. development programme. It was attended by scientists from the International Rice Research Institute, and from Bangladesh, India, Indonesia, Sri Lanka, Thailand and China. They gave reports on international efforts in rice research and the progress in this area in their respective countries, and studied the programme proposed for scientific cooperation. Chinese scientists' reports on the wild rice resources in South China and their use in breeding new hybrid rice varieties, and on the prevention and control of harmful rice insects, aroused interest at the symposium. [Beijing XINHUA in English 1836 GMT 1 Nov 79 OW]

**FORESTRY MISSION IN EUROPE**--Stockholm, 6 Nov--The Chinese forestry machinery study mission led by Yang Tianfang, vice minister of the Ministry of Forestry, left here for Finland today after its friendly visit and study in Sweden. During its 3-week stay in Sweden, the mission visited the forestry machinery firms, wood processing factories and forestry machinery and forest products research institutions. [Text] [Beijing XINHUA in English 2124 GMT 6 Nov 79 OW]

FAO GROUP HOSTS BANQUET--Beijing, November 14 (XINHUA)--A post-harvest technology study group from the Food and Agriculture Organization (F.A.O.) of the United Nations gave a farewell dinner here this evening to mark the end of their tour of China. Members of the group, led by F.A.O. officials Carl Rannfelt and Ove Sode, represent Bangladesh, Burma, India, Iran, Malaysia, the Philippines, Sri Lanka, Thailand, Kenya, Nepal and Pakistan. During their month-long stay in China, they visited Beijing, Wuxi and Shanghai, where they investigated China's management techniques and technology used in storing grain. They were warmly received by local officials and technicians. Members of the group are scheduled to leave China tomorrow. [Text] [OW141522 Beijing XINHUA in English 1511 GMT 14 Nov 79 OW]

GRAIN OUTPUT IN 1975--In 1975 the per capita grain output of China was 610 jin, and its per unit yield was 427 jin. [Text] [Beijing XIANDAIHUA (Modernization) Vol 1, No 1, 1979 p 11]

FORESTRY PROTECTION CONFERENCE--The 12th Joint Forestry Protection Conference of the contiguous zones in Fujian, Zhejiang and Jiangxi provinces was recently held in Xiamen. The Joint Forestry Protection Organization of the 3 provinces includes 6 prefectures and 38 counties. The conference summed up and exchanged experiences in the joint forestry protection work and studied and determined the tasks ahead. The conference commended advanced collectives and individuals in forestry protection and admitted Fujian Province's Wuyi mountain nature reserve as a member of the fourth joint forestry protection zone. [Fuzhou Fujian Provincial Service in Mandarin 0300 GMT 3 Nov 79 HK]

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## BRIEFS

**ANHUI COUNTY RAPE GROWING**--Yuexi County in Anhui is planning to plant 23,500 mu of rape this year, a 20 percent increase over last year's acreage. A total of 1,357 mu of rape seedlings have already been cultivated. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 4 Nov 79 OW]

**COUNTY SHEEP BREEDING**--As of October 1979, Su County in Anhui raised 425,800 sheep, averaging more than 2 head per family. [Anhui Hefei Provincial Service in Mandarin 1100 GMT 5 Nov 79 OW]

**COUNTY HOG RAISING**--By the end of September 1979, the number of hogs raised by Tianchang County in Anhui reached 326,000 head, a 10.8 percent increase over the corresponding period of 1978. As of 20 October, the country procured 65,000 head, some 9,900 head more than the procurement made in last year's corresponding period. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 5 Nov 79 OW]

**OILBEARING CROPS**--In Suxian Prefecture, Anhui, the acreage planted to peanuts and sesame has been expanded to 357,000 mu and 327,000 mu respectively this year. Since the second half of this year, more than 600,000 mu of oilbearing crops in the prefecture have suffered waterlogging. By 2 November more than 13.5 million jin of oilbearing crops had been stored. The prefecture's annual oilbearing crops purchasing plan was overfulfilled by 80 percent. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 11 Nov 79 OW]

**GRAIN, OTHER CROP OUTPUT**--Anhui harvested eight billion jin of wheat this year, an increase of 32 percent over last year, despite the fact that this year's wheat crop was planted during a severe drought. This year's rapeseed, sesame seed, and peanut outputs are also much higher than those of last year. [Text] [Beijing RENMIN RIBAO in Chinese 10 Oct 79 p 2]

**TEA-OIL**--Anhui Province planted 420,000 mu of tea-oil camellia from 1976 to 1978. Sown acreage of camellia has by now reached 900,000 mu in Anhui. Since early this year, some 230,000 mu of camellia have been planted in Anhui. Despite serious drought in 1978, the province's annual output of tea-oil seeds still reached 12 million jin. [Beijing Domestic Service in Mandarin 1000 GMT 25 Oct 79 OW]

SERICULTURE--The people in Anhui reaped a bumper harvest of cocoons this year. By 30 September, they had overfulfilled the yearly plan for cocoon production by 11 percent. The province experienced a severe drought this year which seriously affected the growth of mulberry trees. At present, the people in Jinzhai County have purchased 13,400 dan, an increase of 6.8 percent over the corresponding period of last year. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 15 Oct 79 HK]

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## GOOD AFFORESTATION ACHIEVEMENTS SCORED IN JIANYANG PREFECTURE

Beijing RENMIN RIBAO in Chinese 11 Sep 79 p 2

[Text] Reporter Lin Junqing [2651 0193 0615] filed this report: Remarkable achievements have been made in afforestation in Jianyang Prefecture in the forest region of northern Fujian. Reserves now cover an area in excess of 6.8 million mu, constituting about 30 percent of the entire mountain forest region. Clearings have been regenerated in the overwhelmingly majority of cases. Barren hills have been reduced in area from the original 8 million mu to 4 million mu. Forest cover has been increased from 31 percent in the early days following the liberation of the country to the present 61 percent, or almost double.

How is it possible to score such good achievements in afforestation in the northern Fujian forest region? One important factor is the presence of a contingent of forest personnel. According to statistics, the number of professional forest personnel in the communes and brigades of the region constitutes 6.4 percent of the total labor force in the entire region. In the past few years, these people have established forest cover on a total of 2.33 million mu of land, or over 34 percent of the entire afforested area in the region.

The most important experience of afforestation in the northern Fujian forest region is that the party committee of the region attaches importance to the development of forest production, its policy is realistic, and the forest protection system is sound.

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## BRIEFS

**FUJIAN MARINE PRODUCTS**--FUJIAN RIBAO of 24 October carried a reporter's commentary on developing marine aquatic products. The commentary points out that the coastal line of Fujian accounts for one-fifth of that of the country, making it the key aquatic products province throughout the country. Statistics show that there are 1.5 million mu of beaches and shallow sea that can be used for raising aquatic products. At present, only one-fifth of these areas are being used. The natural resources in Fujian provide 200 species of aquatic products, but only 10 species are currently being cultivated. The commentary reveals that a few years ago, the people in Fujian attached much importance to catching and little to cultivating aquatic products. Raising marine aquatic products mainly depends on the collectives of the communes and brigades. The state should also run aquatic products bases. The commune members should also be allowed to take part in such production. [Fuzhou Fujian Provincial Service in Mandarin 0300 GMT 24 Oct 79 HK]

**RICE HARVEST**--This year, the peasants in Fujian reaped a bumper harvest of single-cropping mid-season late rice. According to statistics on 27 October, 2.2 million mu of mid-season rice had been reaped throughout the province, accounting for 70 percent of the total area. The average per mu yield is several scores to 100 jin higher than last year. This year, a total of 3.1 million mu of mid-season rice were planted in the province, an increase of 150,000 mu over last year. [Fuzhou Fujian Provincial Service in Mandarin 0300 GMT 4 Nov 79 HK]

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GANSU

BRIEFS

LACQUER PROCUREMENT--Lanzhou, 11 Nov--Gansu Province, China's major lacquer-producing area, overfulfilled the whole year's raw lacquer procurement plan by 96 percent at the end of October. The quantity procured was more than double that of the same period last year. This year the province restored more than 14,000 mu of lacquer-tree farms and planted 1.35 million lacquer trees. [Beijing Xinhua Domestic Service in Chinese 0119 GMT 11 Nov 79 OW]

CSO: 4007

## HAINAN LEADERS TALK ON WINTER WATER CONSERVANCY WORK

HK151051 Haikou Hainan Island Service in Mandarin 0330 GMT 13 Nov 79 HK

[Summary] Interviewed by a reporter of HAINAN RIBAO, responsible comrades of the Hainan Regional Water Conservancy Bureau and the regional electricity bureau recently talked about the main tasks of this year's winter water conservancy construction and the way to grasp it. They said: "In farmland capital construction throughout the country this winter and next spring, the central authorities demand that we go all out, strive for practical results, do what we are capable of, take all factors into consideration and make all-round arrangements.

"In accordance with the spirit of the instruction of the central authorities and in connection with the actual situation of our region, the central tasks of our region in farmland capital construction are to repair and clear the channels of water conservancy projects in an all-round and thorough way, strengthen management of water for irrigation, expand the irrigated area and guarantee increased production next year."

"According to our region's climate, there is drought in spring and floods in autumn. Spring drought in varying degrees occurs every year and threatens the growth of early rice. Therefore, to solve the problem of irrigation is an important measure for achieving high and stable yields in our region." Since the founding of the country 30 years ago, our region has built a large number of water conservancy projects, which have played an important part in increasing grain production. Due to improper employment and management of the existing water conservancy facilities, they have been out of repair and the irrigated areas have become seriously smaller than before. According to statistics, the areas irrigated by 58 medium and small water conservancy projects are 16 percent smaller than originally. More than 300,000 mu of land in communes and brigades in the lower reaches of the irrigated areas cannot usually get water and is affected by drought. As a result, production has fallen there.

It rained this year less than usual. The amount of water impounded in the whole region now is 1.4 billion cubic meters less than at the same time last year. Furthermore, water storage is uneven. Some places will

be seriously short of water for the cultivation of early rice next year. To win a bumper agricultural harvest next year, we must repair the channels of water conservancy projects in an all-round and thorough way and seriously strengthen management of water. While repairing and managing well the existing channels of water conservancy projects and restoring the irrigated areas, we must include improvement of the low-yielding fields in key communes and brigades in our plan for water conservancy projects for the year. We must also complete farmland and water conservancy projects in some places to prevent and combat drought.

The responsible comrades pointed out that the tasks of repairing and managing water conservancy projects this winter and next spring are arduous. We must strengthen leadership. We must do a good job of publicity, mobilization and meticulous organizational work.

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## CHEMICAL FOR LURING MALE CORN BORERS

Guangzhou NANFANG RIBAO in Chinese 24 Sep 79 p 3

[Article: "China's Success in the Study of Pheromone of Corn Borers—A new way of eliminating insects is found by personnel of Guangdong Provincial Institute of Testing and Analysis"]

[Text] Recently, the research personnel of Guangdong Provincial Institute of Testing and Analysis have, after their determination of the chemical structure of the pheromone of sugarcane yellow borers, further successfully determined the chemical structure and composition of the pheromone of corn borers of our country, and found a new way of eliminating insect pests in our country by means of pheromone.

At present, in all places over the world, organic pesticides are generally used for the elimination of insect pests. However, the excessive use of these pesticides may possibly destroy the ecological balance of nature, and bring about harmful consequences of environmental pollution. Therefore, in recent years they have tried to find new ways of eliminating insects of crops, among which the use of an active biological matter secreted by the insects themselves, the insect pheromone, for the elimination of harmful insects has received serious attention.

Corn borer is one of the most harmful insects of grain crops in our country. Besides doing harm to corn crops, it also endangers the crops of kaoliang, millet and cotton. To find new ways of eliminating this pest, in 1977 the research personnel of the Provincial Institute of Testing and Analysis began studying the chemical structure of the pheromone of corn borers. With the cooperation of Yangshan County Bureau of Agriculture and the local people, they collected more than 30,000 female corn borers. Meanwhile, they conducted the work of separating, purifying and structural examination. After repeated experiments, in January this year they finally determined the chemical structure and composition of the pheromone of the Chinese corn borers—(765 percent  $\text{CH}_3\text{COOCH}(\text{OH})_{14}$ , about 19 percent negative-12- $\text{CH}_3\text{COOCH}(\text{OH})_{14}$  and about 16 percent positive-12- $\text{CH}_3\text{COOCH}(\text{OH})_{14}$ ). This structure and composition is entirely different from the pheromone of corn borers as reported abroad.



On the basis of their findings, and with the assistance of Jiangsu province's Jintan Insect Hormone Research Institute, they carried out chemical synthesis. They used purified synthetic matter to compound sex luring chemicals according to different proportions. In July and August this year, biological tests were conducted in fields in Yangshan County. It was found that the synthetic matter showed positive luring activity toward male corn borers. Meanwhile, they also sent samples of the purified synthetic chemicals to Tianjin Nankai University for test with an antenna potentiometer, which indicated rather high potential reaction. Thus, it further proved the correctness of the chemical structure and composition determined by the institute.

China's success in the determination of the chemical structure and composition of pheromone of corn borers not only introduces the use of pheromone for the elimination of corn borers, but also provides entomologists with the basis of studying the relationship between environment and living beings, heredity, variation and evolution in species from the aspect of molecular level, by means of their experimental data, that is, homomorphological insects, having grown up in different localities, may secrete different pheromone.

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## BRIEFS

**GUANGDONG COUNTRY HYDROELECTRICITY**--The people in Liannan Yao Autonomous County have set up 76 small hydroelectric power stations in accordance with the local conditions, promoting the economic development on the mountain areas. In 1978, the total value of the local industrial output throughout the county increased by 200 percent over 1970, when there was no small hydroelectric power stations. The output of grain also increased by 27.7 percent. There are four rivers in this county with a total length of 130 km, providing rich water resources. The total installed capacity of these 76 hydroelectric power stations is 10,200 kw, supplying an average of 400 kilowatt-hours of electricity to each farming person in the country. At present, construction of 31 more hydroelectric power stations is underway. When completed, their installed capacity will be 12,000 kw. [Guangzhou Guangdong Provincial Service in Mandarin 2330 GMT ]8 Oct 79 HK]

**HAINAN RURAL WORK CONFERENCE**--The Hainan Regional CCP Committee held a work conference from 19 to 21 October with the participation of cadres from the Han area. During the conference, the participants launched discussions on the criterion of truth, and revealed that a bumper harvest of late rice is expected this year and there are increases in diversified economy. They pointed out that the extremely important tasks in the countryside now is to seriously study Comrade Ye Jianying's national day speech and the relevant documents of the central authorities. It was held at the conference that it is necessary to democratically discuss and formulate plans on fully developing agriculture in the countryside, and particularly promote agricultural production during winter and spring. It is also necessary to properly grasp autumn harvesting and winter sowing, and do a good job of winter farmland capital construction. The emphasis in water conservancy work in winter and spring is on repairing irrigation channels and increasing irrigation area. [Haijou Hainan Island Service in Mandarin 0330 GMT 25 Oct 79 HK]

**GUANGZHOU MEAT PRICES**--Since late October, the meat and vegetable markets in Guangzhou have actively improved management. Earlier, some units unscrupulously increased prices and practiced short-weighting. These markets have now rectified their style of work. [Guangzhou Guangdong Provincial Service in Mandarin 2330 GMT 2 Nov 79 HK]

## BRIEFS

**GUANGXI PREFECTURE LATE RICE**--According to statistics from Hepu, Qinzhou, (Wangcheng) and Lingshan counties in Qinzhou Prefecture, 200,000 persons 790 pumps and another 16,000 pieces of drought resisting tools have been mobilized daily in the past few days. By 12 October, 1.39 million mu of farmland have received side-dressing fertilizer during the period of panicle formation and foliage fertilizer throughout the prefecture, while 2.043 million mu have been irrigated to resist the cold spell. This year, the growth of late rice in this prefecture is comparatively better. However, drought is worsening and the "cold dew" wind is approaching. The people are taking emergency measures to resist drought and the "cold dew" wind. In Lingshan County, 118,000 people were mobilized to irrigate the farmland for resisting the cold spell. Now, 430,000 mu have been irrigated in this country and 303,000 mu have received foliage fertilizer. Drought is more serious in Hepu County. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 19 Oct 79 HK]

**GUANGXI COUNTY "COLD DEW"**--The leadership at all levels in Mengshan County have actively adopted effective measures to resist "cold dew" wind [8 October]. The "cold dew" wind arrived in the country and the temperature in the county dropped to 13 degrees centigrade, affecting rice seedlings. Led by the leading cadres at all levels, the county mobilized 41,000 laborers daily to resist the "cold dew" wind. By now, the people in this county have irrigated 100,000 mu of farmland, sprayed water on 32,000 mu and spread fertilizer on 52,000 mu, resisting the threats from the wind comparatively better. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 16 Oct 79 HK]

**GUANGXI COUNTY FINANCE**--In finance expenditure, the Teng County CCP Committee strives to spend less and achieve more results. Originally, construction of the east section embankment of the (Dadi) reservoir required 1.28 million yuan and took 3 years, but the costs were reduced to 610,000 yuan without affecting the standard of the construction, and the time of construction was reduced by 1 year. By promoting diligence and thrift, the county can invest 80 percent of the local finance revenue every year in production and construction, effectively pushing forward the industry and agriculture production throughout the county. Now, the people in this county has set up 32 county-run enterprises with a total value of output of 46.4 million yuan and built and repaired large and small water conservancy projects in 5,700 areas. There

are now 440,000 mu of effective irrigated areas and 517 large and small power stations. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 28 Oct 79 HK]

CANE SUGAR CONFERENCE--The Guangxi Regional Revolutionary Committee recently held a conference in Nanning on the production of cane sugar throughout the region to study the 1979-1980 sugar extraction work, so as to strive for continuous increases in cane sugar. The conference has also made plans on the production of sugarcane for this winter and next spring. The participants pointed out that it is necessary to do a good job of rectifying enterprises in order to do a good job in the current extraction season, extensively and deeply launch the movement of increasing production and practicing economy, properly man the leadership groups of enterprises and strengthen the management of enterprises with the management of quality as the central task. It is also necessary to organize the departments concerned to closely coordinate and do a good job in one continuous line in production, transport and extraction. It is now necessary to implement the sowing plans earlier. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 1 Nov 79 HK]

MORE CATTLE RAISED IN GUANGXI COUNTY--More than 33,000 cattle are being raised in Fufeng County of Guangxi, averaging nearly 1 head per family. This is the result of the county party committee's 1979 bonus system, under which the local commune members who raise calves for the collective are entitled to 50 percent of the sale price of calves when sold at the age of one year old, or 50 percent of the market value estimated at the same age. [Text] [Beijing RENMIN RIBAO in Chinese 14 Sep 79 p 3]

CSO: 4007



# RAINY SUMMER HINDERS SOWING OF WHEAT

Beijing BEIJING RIBAO in Chinese 2 Sep 79 p 1

[Article: "Officials of Beijing Municipal Bureau of Agriculture and Forestry express views on wheat sowing: Quicken the Maturity of Autumn Grain, Insure Prompt Wheat Sowing"]

[Text] This year the wheat harvest was late by 3 to 4 days in comparison with past years. In addition, it was cloudy and rainy throughout the summer so that the time for sowing (transplanting) summer crops was delayed. As a result, this year, the time for reaping autumn grain naturally will also be delayed, and this delay will certainly affect prompt wheat sowing. Emergency measures should be taken immediately to quicken the maturity of autumn grain and insure prompt wheat sowing. For this reason, our reporter visited the Beijing Municipal Bureau of Agriculture and Forestry and asked the comrades concerned to express their views.

According to the bureau's comrades, the statistics provided by the meteorological office of Beijing Municipal Institute of Agricultural Sciences show that since the latter half of June this year, the temperature has been consistently low, and this autumn is expected to be rather cold. Thus, the time for sowing wheat should be from 18 to 24 September, 1 week earlier than last year. However, it is almost certain that the maturity of autumn crops will be late this year. According to studies done by some counties and communes, this year the time of earing of maize Jing-early No 7 will be delayed by 3 days in comparison with last year. The summer sown maize will mature around the end of September and the beginning of October. The time of maturity of rice following wheat will be late by 5 to 7 days in comparison with last year.

To achieve a good harvest of autumn grain and insure the prompt sowing of wheat, it is now necessary to intensify the late management of autumn grain crops and try by all means to quicken their maturity. Based on past experience, the following measures should be taken:

Immediately drain the water. This year, rainfall has been plentiful; the days are cloudy and soil humidity is high. Shallow hoeing helps to raise soil temperatures and evaporate the surface water. Weeding helps ventilation and promotes root activity. Water should be drained immediately from water-logged plots to activate the crops' roots.

Measures to be taken according to local conditions. On plots where the third crop may be reaped, it should be reaped first while the middle crop of maize should be chopped down to create ventilation and provide light for the third crop and to quicken its maturity. On plots where the harvest of the third crop is hopeless, decisive measures should be taken to chop it down, apply manure to the land and insure prompt wheat sowing. On plots where maize was sown in the summer, water-logging is serious and there is no hope for its harvest, the land should be cleared up immediately for sowing.

Remove the lower leaves. After maize and kaoliang are saturated with water, their lower leaves should be removed to aid ventilation and light. Meanwhile, useless plants should be pulled out to reduce the consumption of nutrients.

Squat plants and store sprouts. After maize grows green skin and kaoliang is saturated with soil water, either one may be chopped down first so that the nutrients in the stalks and leaves can continue to enter the ears. This method can shorten the normal period of harvest by about 1 week.

Spray fertilizer on the leaves. Before the rice following wheat grows ears, on each mu of field, a mixture of two liang of dihydrate potassium phosphate and 100 jin of water may be sprayed as fertilizer on the leaves to quicken earing and the circulation of the nutrients.

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## HEBEI

### BRIEFS

GRAIN OVERFULFILLMENT--As of 23 October, Shahe County in Hebei Province, procured 32.4 million jin of grain and the quality was better than in previous years, overfulfilling the annual grain procurement task. It is anticipated that the total annual grain output may reach 220 million jin, overfulfilling the grain output in 1978 by 10 million jin. [Shijizhuang Hebei Provincial Service in Mandarin 1100 GMT 25 Oct 79 SK]

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## BRIEFS

HEILONGJIANG FARMLAND--Tangyuan County has completed 325,000 cubic meters of earth and stone works in the current farmland capital construction. It has reclaimed and afforested 7,100 mu of land, accumulated 59,000 cubic meters of manure and leveled 13,000 mu of field. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 31 Oct 79 OW]

COUNTRY FARMLAND IMPROVEMENT--Hulin County in Heilongjiang has reaped a bumper wheat harvest this year, with per-mu yield reaching 270 jin, or a 24 percent increase over last year. As of 21 October, the country plowed 128,000 mu of farm fields and sank 767 power-operated wells. [Harbin Heilongjiang Provincial Service in Mandarin 2200 GMT 3 Nov 79 OW]

COUNTRY RICE PRODUCTION--Huachuan County, Heilongjiang, has reaped good harvests of its 180,000 mu of rice. The country's total rice output this year is expected to exceed 90 million jin, over 10 percent more than its 1978 rice production. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 5 Nov 79 OW]

GRAIN PRODUCTION--Cadres and commune members in Nehe County, Heilongjiang, are actively selling and delivering grain crops to the state. As of 5 November, they have delivered and sold 100,000 dun of grain to the state. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 10 Nov 79 OW]

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## BRIEFS

**COTTON CONFERENCE**--On the evening of 3 November, the Henan people's government held a telephone conference, which demanded that the various areas whip up an upsurge of harvesting and purchasing of cotton, fulfill and overfulfill the task of purchasing cotton this year and support the production of the light and textile industries. Wang Bingzhang, Standing Committee member of the Henan Provincial CCP Committee and chairman of the finance and trade office of the Henan Government, presided over the conference. Yue Xiaoxia, deputy governor, spoke. He said that the province experienced drought, low temperature and rain during the planting of cotton this year. As a result, output in some cotton farmland was reduced. However, the general growth was good. He urged all the cotton-growing areas to solve the existing problems in the harvesting and purchasing of cotton. He noted that the output of cotton in Henan has declined every year, while stocks of cotton have also fallen. He urged the various areas to insure the planting of 9 million mu of cotton in 1980. [Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 6 Nov 79 HK]

**CIRCULAR ON WHEAT SOWING**--According to a circular issued by the Henan Provincial people's government on 2 November, by the end of October, Henan Province had fulfilled over 90 percent of its wheat sowing plan. According to the weather forecast, signs of drought in the province will continue to develop. Some of our comrades have not attached importance to the signs of drought and some of them have not firmly grasped work in combating drought and wheat sowing. The circular called on leaders at all levels to overcome all slackening of vigilance and mobilize the masses to try in every possible way to promote wheat sowing. [Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 3 Nov 79 HK]

**CONFERENCE ON WHEAT SOWING**--The Henan Provincial CCP Committee and the provincial people's government held a telephone conference on the evening of 2 November, calling on party committees and government departments at all levels to mobilize the masses to promote wheat sowing and drought fighting. Dai Suli, secretary of the provincial CCP committee and vice governor of the provincial people's government, delivered a mobilization speech. Provincial agricultural committee vice chairman (?Peng Mingzhu) read the provincial people's government's circular on promoting wheat sowing. The conference called for overcoming slackening of vigilance, strengthening labor management and promoting farmland capital construction. [Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 3 Nov 79 HK]

**SALINE-ALKALINE SOIL IMPROVED**--More than eight million mu of the twelve million mu of saline-alkaline land in the area once flooded by the Huanghe River in Henan have been improved by digging more shallow ditches to drain off excessive ground water to prevent further salinization and alkalization. In the past, deep ditches were dug to lower the water table. Since the soil was improved, many reports on higher crop yields have been received. The average grain yield of a production brigade in Neihuang County reached 1347 jin per mu last year, as compared to only 100 jin prior to 1970. [Text] [Beijing GUANGMING RIBAO in Chinese 7 Oct 79 p 1]

**HENAN WHEAT**--Henan radio broadcast a contributing commentator's article which said: With the effective support of the various trades and professions, the cadres and masses in the countryside throughout Henan have victoriously fulfilled the tasks of wheat sowing after overcoming natural disasters. This year, the people in southern Henan experienced heavy rain while those in the north suffered from drought. At present, it is necessary to overcome drought, inspect seedlings and replant if necessary and give free rein to the masses. According to weather forecasts, it is possible that drought will worsen. Therefore, it is necessary to prepare for flood prevention and resisting drought and make full use of the existing water resources and irrigation equipment. The article pointed out that the leadership at all levels must go deep into the front line of production, seriously implement the party's rural policy, establish a strict system of production responsibility and lay the foundation for reaping a bumper wheat harvest next year. [Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 29 Oct 79 HK]

**HENAN AGRICULTURAL RALLY**--The Henan mobilization rally for investigating agricultural resources and zoning was held in Yu County on 28 October. Some 200 people took part. Also present was Dai Suli, secretary of the Henan Provincial CCP Committee and deputy provincial governor, who gave an important speech. He explained the importance of analyzing agricultural production in Henan over the last 30 years since the founding of China and urged all the cadres to study science. [Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 29 Oct 79 HK]

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## BRIEFS

**HUBEI EMBANKMENT**—The large embankment on the Jing River was built in 1952 in Hubei and was completed in 75 days with the participation of 300,000 army men and people. The embankment prevented a serious flood from becoming a disastrous tragedy and protecting the banks of the Jing River and Wuhan Municipality. Since liberation, eight serious floods occurred on this river with the water level exceeding those in 1931 and 1935, but the embankment prevented a tragedy from occurring. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 14 Oct 79 HK]

**COUNTY AGRICULTURE**—By 20 October, the peasants in Gucheng County have sown 203,000 mu of autumn crops, accounting for 52.6 percent of autumn sowing. To insure the quality of autumn sowing, the county CCP Committee has put forward the standard of autumn sowing this year. The county has also mobilized 80 percent of the total labor forces to autumn sowing. Of the 11 standing committee members of the county CCP Committee, nine have settled in the communes and brigades. The county and communes have also transferred 240 office cadres to strengthen the leadership of autumn sowing in the remote and backward brigades. There are now a total of 33,000 mu of sample fields throughout the county. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 25 Oct 79 HK]

**HUBEI PREFECTURE'S AUTUMN SOWING**—Xiangyang Prefecture has mobilized some 1.5 million laborers and some 6,400 tractors to take part in autumn sowing. By 21 October, some 2.3 million mu had been sown, amounting to 42 percent of the entire planned areas of autumn sowing. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 29 Oct 79 HK]

**COTTON PRICES**—Some of the cotton procurement departments in Huanggang Prefecture have depressed the price of ginned cotton, and the commune members have complained about it. By the end of September, the prefecture had purchased a total of 330,000 dan of ginned cotton. The average price for each dan was 138.87 yuan, 10.28 yuan less than the standard set by the state after a 15.2 percent increase. According to the procurement department, the main reason for the reduction of price was bad weather, affecting the quality. However, investigation showed that this was not the case. The weather has been finer than ever before. The commune members hope that the departments concerned will properly implement the party's policy on procurement. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 3 Nov 79 HK]

PREFECTURE DISTRIBUTION--The Jingzhou Prefectural CCP Committee recently explicitly announced the abolition of the irrational stipulation on restricting the level of the commune members' yearend distribution to below 150 yuan, as in the past few years. The commune members can increase their income when they increase production. The decision of the prefectural CCP committee is warmly supported by the cadres and masses. According to preliminary statistics this year, there are 1,745 production teams whose members received an average of 200 yuan per person, an increase of 150 percent over last year. There are also 68 production teams whose members received an average of 300 yuan per person, an increase of 64 over last year. Some 90 percent of commune members throughout the prefecture will receive more income this year. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 7 Nov 79 HK]

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## BRIEFS

**FARM PROFITS**--Because the 12 big state farms in Hunan are responsible for their own financial affairs this year, their economic situation has greatly improved. From January to September this year, they made a total profit of 10.58 million yuan in industrial and sideline production and animal husbandry. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 3 Nov 79 HK]

**FARM MACHINERY CONFERENCE**--Hunan recently held a conference on overhauling and supplying farm machinery in winter. Representatives of some 20 companies and repair works suggested strengthening management and use of the machinery, doing a good job of maintenance and production and supply of parts, and improving services. The participants to the conference pledged to insure good running order for 90 percent of machinery and studied the issues of how to build and properly run service companies for agricultural mechanization. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 7 Nov 79 HK]

**BUMPER SESAME CROP**--The people in Hunan reaped an unprecedented bumper harvest of sesame this year. By 20 October, 139,186 dan of sesame had been reaped, overfulfilling the year's plan by 96.04 percent. This is 7.12 times higher than last year. The reason for the high output of sesame this year is the increase in the state purchasing price. Recently, the Hunan Grain Bureau issued a circular on supplying sesame oil to the people in the same way as supplying tea-seed oil and rapeseed oil. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 2 Nov 79 HK]

**JUTE, HEMP PRODUCTION**--Hunan grew 150,000 mu of ambary hemp and jute this year, an increase of 65,000 mu over last year. The total output was 800,000 dan, an increase of 90 percent over last year. In the past, planting of jute and ambary hemp was spread over 20 counties throughout the province, with low output and marketability. This changed in spring this year after reducing cultivation in the low-yielding scattered areas and increasing it in concentrated high-yielding areas. [Changsha Hunan Provincial Service in Mandarin 1100 GMT 4 Nov 79 HK]



## ADJUSTMENT IN AUTUMN SOWING PLANS MADE

Beijing RENMIN RIBAO in Chinese 15 Sep 79 p 3

[Text] XinhuanShe, Nanjing 13 Sep--The Jiangsu provincial conference on autumn sowing and farm capital construction has resolved to make appropriate adjustments in the agricultural position, beginning with adjusting this year's fall seeding plans in the light of realities.

The conference determined that within a period of time henceforth the grain position must be stabilized and that articles must be written about boosting single crop farming. And to boost single crop farming, taking into consideration the fact that the mean per mu yield of barley, wheat and naked barley in the province broke through 400 jin this year, it is necessary to write articles, first of all, about the three wheats. In the high yield area of southern Jiangsu, it was resolved to strive for "the target of obtaining an upsurge in production of the three wheats in a single season." In the area north of the Huai River, it was resolved to reduce the area of winter fallow land, expand the acreage sown to the three wheats, and put an end to seeding in fields that have not been manured. Regarding paddy rice and dry land crops, especially regarding the question of the three crop system and double crop system, the conference submitted that the general principle is to be realistic and adapt the working method of the local conditions so as to guarantee a steady increase in grain production. Historically the three crop system has played a part in increasing production, but still it cannot be cut with a knife at one stroke. The acreage sown under the three crop system may be suitably reduced in the limited number of places where the population is small and arable land is plentiful and the ratio under the three crop system is excessive or for many years the yield of three crops has not equaled that of two crops or an increase in production has not been accompanied by an increase in income because the conditions do not exist. In places where the three crop system will be practiced, the three crops do not necessarily have to be wheat, rice, rice. Experiments and investigations may be carried out in various forms, such as rape, rice, rice; wheat, legume, rice; wheat, green manure, rice; wheat, corn, rice; rape, green manure, rice; and wheat, feed crop, rice. Of course, caution should be exercised in popularizing new experiences.

The Jiangsu provincial conference on autumn sowing and farm capital construction also considered the state of the diversified economy for the whole year, the fertilizer position, the feed position, forestry planning, animal husbandry planning and fishery planning.

In the midst of autumn sowing, people in various areas in Jiangsu Province are already making rational adjustments in the agricultural position according to the general policies set at the conference. In Yangzhou Prefecture, it has been decided to restore the acreage under winter green manure crop to the original 2.3 million mu in order to guarantee that every mu of next year's 5 million mu of paddy rice will have its "basic food ration." Furthermore, they are preparing to utilize the stubble fields of early autumn crops to plant 800,000 mu of feed. In Huaiyang Prefecture, there is 3 million mu of cultivated land which is under crop for only one season in a year and another 2 million mu which lie fallow in winter. The land utilization rate is very low. Proceeding from this actual situation, the prefecture party committee is preparing to expand the three wheat crops by 1 million mu, the rape crop by 500,000 mu, and the winter green manure crop by 2 million mu, and change gradually from one crop a year or three crops in two years to double cropping. This type of planning has been put into full effect in the production teams.

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## BRIEFS

**SILK COCOON PRODUCTION**--Jiangsu Province has reaped a bumper harvest of silk cocoons this year. As of 8 November, the province had already procured 635,000 dan of silk cocoons. This was more than 20 percent higher than last year and a new production record. [OW160301 Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 9 Nov 79 OW]

**WHEAT GROWING**--As of early November, more than 3 million mu of the 4.4 million mu of wheat, barley, naked barley, broad bean and pea in Yancheng Prefecture, Jiangsu, had been watered. Sheyang County daily engages more than 90,000 people, some 340 power-irrigation stations and over 2,300 pieces of machines in fighting drought and protecting wheat seedlings. The more than 400,000 mu of wheat, barley and naked barley in Guannan County are thriving. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 16 Nov 79 OW]

**FUNING COUNTY FIELD MANAGEMENT**--Funing County, Jiangsu, has intensified its management of wheat, barley and naked barley. By 10 November, the county had checked 189,000 mu of cropland and replanted the withered plots, applied additional manure on 48,000 mu of field and irrigated 582,000 mu of cropland affected by drought. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 13 Nov 79 OW]

**COTTON PROCUREMENT**--As of now, Nantong, Yancheng and Suzhou prefectures, in Jiangsu, have delivered to the state an average of over 100 jin of jinned cotton from each mu of cottonfield. Nantong Prefecture has already sold 3,098,000 dan of cotton to the state. Yancheng Prefecture has sold 2,591,700 dan of cotton to the state. [Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 12 Nov 79 OW]

**BINHA1 COUNTY DROUGHT**--Binhai County in Jiangsu has mobilized 266 electric pumping stations and more than 2,000 diesel engines to combat drought. So far, some 200,000 mu of the county's 510,000 mu of wheat, barley and naked barley are growing well. [Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 7 Nov 79 OW]

**HUAIYIN PREFECTURE AGRICULTURE**--As of 2 November, Huaiyin Prefecture, Jiangsu, had irrigated nearly 3 million mu of wheat, barley and naked barley, and over 1.3 million mu of green manure, or 70 percent of the green manure acreage affected by drought. [Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 7 Nov 79 OW]

JIANGSU COUNTY WHEAT CROPS--Tongshan County, Jiangsu is planting 500,000 mu of wheat. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 5 Nov 79 OW]

JIANGSU SERICULTURE--Suzhou Prefecture, Jiangsu, has reaped a bumper harvest of silk cocoons this year. The total output in spring, summer and autumn has exceeded 165,000 dan, representing more than 20 percent higher than last year. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 2 Nov 79 OW]

JIANGXI AGRICULTURE--This year, the grain output of Yichun Prefecture, Jiangxi, has increased to 420 million jin, up from last year's 400 million jin. Output of cotton and oil has increased over 30 percent. By 20 October, the prefecture had nurtured 58,000 mu of rapeseed seedlings, sowed 50,000 mu of rapeseeds, planted 36,000 mu of green manure and accumulated over 67 million dan of farm manure. [Beijing XINHUA Domestic Service in Chinese 0308GMT 9 Nov 79 OW]

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JIANGXI

BRIEFS

RED SOIL IMPROVED IN JIANGXI--The yield from the more than six million mu of low-yield red soil farmland in Jiangxi has been raised by 11 to 63 percent. This is the result of research on red soil and the large-scale promotion of the findings of such research for many years. Forty-six percent of the land in this province is red soil land, 60 percent of its paddy fields is red soil paddy fields, and, therefore, the utilization and improvement of red soil are very important to the development of agriculture in Jiangxi. [Text] [Beijing GUANGMING RIBAO in Chinese 7 Oct 79 p 1]

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## BRIEFS

SUGAR BEET PRICE BOOST--At the beginning of this year, the Jilin Provincial Revolutionary Committee issued a policy increasing the purchasing price of sugar beets from 60 to 75 yuan per ton. This has boosted the peasants' enthusiasm for planting sugar beets. Output of sugar beets in Nongan, Fuyu, Daan, Qianan, Taoan, Shuangliao and Zhenlai counties as well as Qian-quo-er-luo-si Mongolian Autonomous County has increased respectively by about 5 to 30 percent over last year. Collective income from sugar beets in the whole province increased about 7 million yuan. By 29 October, the whole province had carried out 70 percent, or 330,000 tons, of the total sugar beet purchasing plan, an increase of 23 percent over the same period of last year. [Changchun Jilin Provincial Service in Mandarin 1100 GMT 1 Nov 79 SK]

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## LIAONING

### BRIEFS

RICE HARVEST--The suburban areas of Yingkou Municipality, Liaoning Province, has finished harvesting rice of 1.6 million mu. [Shenyang Liaoning Province in Mandarin 1100 GMT 19 Oct 79]

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## BRIEFS

**BUMPER SUGAR BEET HARVEST**--The western area of the Nei Monggol region reaped a bumper harvest of sugar beets this year. The total output reached 330,000 tons, showing an increase of nearly two and a half times the output in 1978. Ba-yan-nao-er League, the major beet-producing area in the region, also reaped a bumper harvest and the total output reached some 205,000 tons, creating an all-time record in beet production. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 28 Oct 79 SK]

**CAMEL PRODUCTION**--(Ba-yi-wen-du-er) Brigade of (Ba-yi-en-ge) Commune in Hang-jin Banner, Nei Monggol region, has 1,041 head of camel this year. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 2 Nov 79]

**SILKWORM COCOON PRODUCTION**--This year Nei Monggol achieved a good harvest of silkworm cocoons. Production of tussah cocoons amounted to 1.52 million jin and that of ordinary silkworm cocoons 18,000 jin. Zhao-wu-da and Zhe-li-mu leagues cultivated 280 mu of mulberry saplings, laying a good foundation for developing sericulture next year. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 13 Nov 79 SK]

**AFFORESTATION PROJECT**--Various localities in Wu-lan-cha-bu League in Nei Monggol are whipping up an upsurge in carrying out autumn afforestation. As of 2 November, the whole league completed planting trees on 310,000 mu of land, overfulfilling 6 percent of the annual afforestation task. The total acreage for sapling cultivation reached 112,000 mu, surpassing the annual plan by 12.9 percent. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 7 Nov 79 SK]

**OIL-BEARING CROPS**--Shandu County, one of the major oil-bearing crop producing areas in Nei Monggol, reaped a bumper harvest of oil-bearing crops this year. The total output reached 24.37 million jin. This year about 306,000 mu of oil-bearing crops were planted in Shangdu County, an increase of 61,000 mu over 1978. By the middle of October, 4.8 million jin of oil-bearing crops had been stored. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 1 Nov 79 DX]

## BRIEFS

**INCOME DISTRIBUTION MEETING**--On 10 November, a year-end cash distribution meeting was held at the (Zhongchun) brigade in (Pingan) County, Qinghai. Liang Buting, second secretary of the provincial party committee; (Hong Gao), Standing Committee member of the provincial party committee and first secretary of the (Haidong) Prefectural Party Committee; and (Ma Shuji) and (Ma Shichang), secretary and deputy secretary of the (Haidong) Prefectural Party Committee, attended the meeting. Also attending the meeting were leading members of the (Haidong) military subdistrict, (Pingan) County Party Committee and people's communes in the county. It was reported at the meeting that per capita income of the brigade has reached 213 yuan this year, 21 yuan higher than last year. [Xining Qinghai Provincial Service in Mandarin 1100 GMT 13 Nov 79 OW]

**TELEPHONE CONFERENCE**--The Qinghai Provincial People's Government called a telephone conference on the evening of 14 November to make arrangements for yearend distribution, grain and oilbearing crop procurement, farming preparations and farmland improvement. The conference stressed implementation of the distribution policy, called for timely fulfillment of the grain and oilbearing crops purchasing plan and urged acceleration of farmland improvement projects. Regarding farming preparations, it drew attention to manure accumulation, seed selection and inspection and servicing of farm implements. Zhao Haifeng, vice governor of the provincial people's government, presided over the conference. It was attended by Ya-bu-long and leading comrades of the concerned provincial offices. [Xining Qinghai Provincial Service in Mandarin 1100 GMT 51 Nov 79 OW]

**QINGHAI CROSSBRED SHEEP**--As of the end of August, Wulan County, Qinghai, had more than 284,000 head of crossbred fine-wool sheep, representing over 97 percent of the county's fine-wool sheep. The total wool output of the county has increased from some 600,000 jin in 1959 to today's 1.24 million jin. [Xining Qinghai Provincial Service in Mandarin 1100 GMT 30 Oct 79 OW]

**HUANGZHONG COUNTY FARMLAND CONSTRUCTION**--Huangzhong County, Qinghai, has engaged 38,000 people in farmland capital construction and has leveled 5,500 mu of ground. [Xining Qinghai Provincial Service in Mandarin 1100 GMT 10 Nov 79 OW]

## IRRIGATION WATER BEING WASTED

Beijing RENMIN RIBAO in Chinese 6 Sep 79 p 2

[Article by Xiang Zhou [3276 5297]: "Kaiyuan Had Better Staunche the Flow"]

[Text] If you thumb through historical records for Shaanxi Province, you will see that in the course of 3,000 years the region sustained 394 major natural calamities of which 294 were droughts. Fighting drought requires water, but water resources throughout the province are not abundant. Surface water is especially lacking, requiring an annual expenditure of large amounts of capital to build water conservancy projects to tap the water potential. In years of great drought, large amounts of machinery must be employed to pump water. Many people say that in this region, "a drop of water is as precious as a drop of oil." This is no exaggeration.

But if "water is as precious as oil," it certainly isn't "valued like oil." This year, when a serious drought occurred in Guanzhong on the central Shaanxi plain, many communes and brigades were still using "large amounts of water for flood irrigation." The water spilled over the boundaries of the fields to flood the highways, only to be wasted.

Qian County's pilot project water conservancy site at Tiefoling figured out a ratio: for a single mu of wheat irrigated by the flood irrigation method, 200 cubic meters would be consumed. By switching to the border method of irrigation only 50 to 60 cubic meters would be required. The sprinkling irrigation system would require only 20 cubic meters of water, and the drip method of irrigation would require only 10 cubic meters of water. This demonstrates that it is extremely important for Kaiyuan to staunch the flow and to use water scientifically.

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## BRIEFS

SHAANXI AGROSCIENCE--The agricultural departments in Shaanxi have adopted active measures to further speed up the building of the four-level agro-science network. There are now 95 agroscience centers at county level throughout the province. The masses' agroscientific research is vigorously developing. In 1978, Li Erzong, secretary of the provincial CCP Committee, inspected (Weima) brigade in Xingping Country, which had scored great increases in output of grain and cotton. He discovered that the important reason why this brigade reaped bumper harvests was because agroscience had been popularized by the brigade's agroscience station. The provincial agricultural bureau has decided to grasp 1 or 2 counties in each prefecture and 12 key counties, 100 key communes and 1,000 key brigades throughout the province. The bureau will then select from the 12 counties the best county as the typical example in agroscience for the whole province. [Xian Shaanxi Provincial Service in Mandarin 1300 GMT 27 Oct 79 HK]

AERIAL AFFORESTATION--The Shaanxi Forestry Bureau recently held a symposium in Ningqiang County to exchange experiences in aerial afforestation and study the tasks and measures for afforestation. Ever since aerial afforestation succeeded in Ningqiang County in 1972, five prefectures and 15 counties have carried out this method. By spring 1979, Hanzhong and Shangluo prefectures had sown 1,364,000 mu of trees by air. The participants to the symposium pledged to do a good job of inspecting the seed strains before sowing. [Xian Shaanxi Provincial Service in Mandarin 1300 GMT 26 Oct 79 HK]

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LAND-IMPROVEMENT PROJECT--Last year, after the national farmland capital construction conference, the Shandong Provincial Revolutionary Committee decided to start a land-improvement project covering some 3 million mu in Qihe, Yucheng, Pingyuan, Gaotang and Chiping counties. Through 1 year of effort, the first phase has been completed, bringing a new look to some 630,000 mu of previously alkaline land. This phase of work included some 2,100 canals, 2,480 sluices, 4,699 pump wells and 149 pump stations. Apart from soil amelioration, the acreage of irrigated land was expanded by 261,000 mu. More than 21 million trees were also planted. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 7 Nov 79 SK]

FORESTRY FARMS--There are now 8,202 commune- and brigade-run forestry farms in Shandong Province. These forestry farms cover a total area of 5.54 million mu. The total lumber reserve is estimated at 2.26 million cubic meters. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 7 Nov 79 SK]

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## SHANGHAI SUBURBS MODERNIZING AGRICULTURE

Shanghai WEN HUI BAO in Chinese 10 Aug 79 p 3

[Article by Wan Jingliang [5502 2529 0081], of the agricultural office of the Shanghai Municipal Revolutionary Committee: "Proceed From the Actual Conditions of Shanghai Suburbs and Explore Ways for Modernizing Agriculture"]

[Text] Agriculture is the foundation of our national economy. In his "Report on Government Work," Comrade Hua Guofeng fully explained the great significance of gradually modernizing agriculture according to our country's conditions. How do we modernize agriculture? I wish to present my views by proceeding from the actual conditions in Shanghai's suburbs.

First of all, we must increase the use of the land to the maximum and increase the yield of unit area. These two requirements must be our starting point.

There is no doubt that in order modernize agriculture, we must raise labor productivity extensively. In some countries of Europe and America, on the average every agricultural worker has hundreds and even thousands of acres of farmland. Therefore, they not only can sacrifice unit yield to raise labor productivity by expanding the acreage of the individual farmers, but they can also sacrifice a part of farmland to attain the same aim by raising the yield of unit area under cultivation. However, our country has a huge population and limited arable land. It is not practicable either to sacrifice unit yield or acreage. Thus, in modernizing agriculture, we must make great efforts to raise the utility of land and increase the yield of the unit area.

At present, in Shanghai's suburbs, the utility of land and the yield of the unit area have both reached a fairly high level. The multiple cropping index of grain fields is 2.53, the annual per-mu yield of grain is 1,606 jin, of grinned cotton is 169 jin and of rapeseeds is 304 jin. However, there are two outstanding problems. One is instability. For many years, in Shanghai's suburbs agricultural output has been high but not stable, going up and down on a large scale. The fundamental reason for this situation has been the inability to fight natural disasters. In spite of many year efforts to greatly improve the water conservation conditions in the suburbs, we still have not freed ourselves from the influence of natural disasters. For this

reason, we must grasp this principal contradiction and undertake further capital construction of farmland. The original project of the main river course should be completed quickly. In the future, stress should be placed on the auxiliary construction of tributaries and the irrigation system and on the construction of major grain fields. We must take the initiative to achieve a high and stable productivity, instead of relying on natural conditions, and help our agricultural production in the suburbs gain stability on its existing foundation and move up to a new level.

The other problem is the great differences in output between communes and production brigades. The cause of imbalanced production is manifold, involving seeds, fertilizer and cultivation techniques. However, there is even a fairly large imbalance of output under similar conditions. The crucial problems are the poor performance of machines and the failure to understand the farming seasons. The index of multiple cropping is high in the suburbs. On those the crucial days of reaping and sowing against time, there has always been a shortage of labor power. In addition, our machines which pull up and plant seedlings were not working satisfactorily. A considerable number of plots were not planted in time and output could not increase. They became "deterrent fields." Furthermore, some communes could not understand the farming seasons and hesitated to adopt measures which would increase production, such as transplanting cotton after the wheat harvest. To solve this problem, proper adjustments should be made in choosing varieties for multiple cropping and arranging crop rotation; however, it is even more important to organize the necessary personnel as quickly as possible for the mechanization of reaping and sowing. This will not only play a decisive role in raising the utilization of the land and increasing unit yield, but also have a great significance in reducing labor intensity and raising labor productivity. The Malu brigade of Malu commune in the suburbs, a totally mechanized experimental unit, has made some tests in using farming machines with their auxiliary tools, and raised the efficiency of labor this year to a great extent. The brigade has more than 950 workers and over 400 of them were spared to pursue industrial and sideline production. In the first half of this year, the brigade earned a net income of some 70,000 yuan from its industrial and sideline enterprises.

Secondly, we must integrate agricultural modernization closely with the industrialization of communes, and locally absorb and make arrangements for the surplus agricultural labor.

In capitalist countries, with the progress of agricultural mechanization, a large proportion of the surplus rural population flowed blindly into cities to look for other jobs or to reinforce the big army of urban unemployed. Ours is a socialist nation with a rural population of 800 million. We cannot slow the pace of agricultural mechanization because of a large rural population by such methods as fixing the number of workers in fields, working by turns, restricting attendance at work and passively rejecting mechanization in the busy farming seasons. Also, we cannot take the capitalist countries' road and let hundreds of millions of peasants who are released because of large-scale mechanical production to flock blindly into the cities. Therefore, we must consider the problem of making arrangements for and absorbing the surplus rural labor on the local level. As far as the Shanghai suburbs are

concerned, this point is especially important. Shanghai is the largest industrial city in our country, with an urban population of 6 million. If a surplus suburban labor force of tens of thousands rushes into the city, it would be a disaster. I believe that one important way to solve this problem is to integrate the modernization of agriculture with the industrialization of the communes.

Our rural people's commune is a comprehensive economic body, including all agriculture, forestry, animal husbandry, sideline production and fisheries as well as workers, peasants, soldiers, students and merchants. In fact, it is a "small society" which possesses all the conditions for taking the road of combining agriculture, sideline production and industry, and combining agriculture with industry and commerce. A commune should not only turn out products of agriculture, forestry, animal husbandry, sideline production and fishery, but also undertake industrial processing locally so that agriculture will be integrated closely with industry for mutual reliance, by operating the industries around agriculture. Such commune industries, integrated with agriculture and closely serving it, not only have great vitality but also solve the problem of arranging for any surplus labor locally.

At present, a fairly good industrial foundation exists in the suburbs on the three levels of county, commune and brigade. In 1978, the total industrial output value constituted 46.8 percent of the total incomes of the three levels, becoming an extremely important component of the collective economy of people's communes. More than 470,000 workers were engaged in the industries of the communes and brigades, constituting 17.1 percent of the total rural labor force. In the future, with the gradual progress of the industrialization of communes, and especially with the gradual localization of the processing industry of agricultural and sideline products, the number of people working for the industries of the commune and brigade will increase dramatically. Of course, it still requires strong support from urban industrial departments.

Thirdly, we must rely mainly on the peasants' own accumulation as the source of funds for the modernization of agriculture.

Our nation has a weak economic background and a poor industrial foundation. It is impossible for the government to take the whole responsibility for funding agricultural modernization. The only way is to rely mainly on the peasants' own accumulation, with the support of the government. Thus, the people's communes should be helped to develop and strengthen their collective economy quickly. Facts prove that with the growth of a collective economy, the pace of agricultural modernization can be greatly accelerated. For an example, in water conservancy construction, in the past 30 years besides the labor accumulation of the agricultural labor force of 2.76 million peasants in suburbs, each having contributed nearly 400 cubic meters of earth work, the collective gave 220 million yuan to the water conservation investment of more than 600 million yuan, that is, 33 percent of the total funds. To the investment of more than 400 million yuan for agricultural mechanization, the collective contributed 80 percent while the state investment constituted only 20 percent. To strengthen collective economy quickly, since the third plenary



session of the 11th Party Central Committee, the party and the government have taken a series of important policies and measures, including economic measures, to strengthen their support of agriculture. This year, the government has increased its agricultural investment from 10.7 to 14 percent. In addition to other items of funding of agriculture, the total amount reaches 17.4 billion yuan. In the next 2 years, the percentage of investment will also increase appropriately. At the same time, the government has also increased greatly the purchasing prices of major agricultural and sideline products. According to a rough estimate, this year all suburban people's communes can receive from this source alone an average income of 38 yuan more per capita. All the peasants said happily: The policies of the third plenary session are really fine; if it goes on like this, there is no reason why our agriculture can't be a success.

At present, in the Shanghai suburbs all communes and brigades, in coordination with the readjustment of the economy, are making their plans for great development by integrating agriculture with industry and sideline production. They have said: To make our collective wealthy, we must develop agriculture, industry and sideline production. With a high and stable agriculture as the main body, armed with the two "wings" of sideline production and industry, the commune's collective economy can quickly start soaring and can accumulate still more funds to accelerate the modernization of agriculture and lay down a more solid foundation.

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## AGRICULTURAL MECHANIZATION IN SHANGHAI ENVIRONS EXPANDING

Beijing GUANGMING RIBAO in Chinese 7 Oct 79 p 2

[Article by Ling Yan [0407 1484] and Yang Lizhen [2799 7787 3791] of the Agricultural Economics Office of the Shanghai Social Sciences Institute: "Agricultural Mechanization and Rural Economic Reform Must Be Promoted Together. A Look At the Trend of Development From the Present State of Agricultural Mechanization in Shanghai"]

[Text] The mechanization of agriculture constitutes a revolution in agricultural productivity, and it is a thoroughgoing change from traditional agriculture. Our country still has a traditional agriculture that uses men and animals as the means of locomotion; and it is characterized principally by "complete though small" and production to supply one's own needs. In order to thoroughly change this state of affairs, along with a change in production methods must come a series of economic measures among which are development of the production of manufactures in rural villages, expansion of the scope of management, and changes in the production structure and economic structure of rural villages so that both the rural labor force and natural resources will be used to the full, the level of agricultural accumulation will vastly increase, reproduction capabilities will be enhanced and enlarged, and the degree of specialization and socialization of agricultural production will be increased. The technological remodeling of agriculture and the transformation of the rural economy are a mutual cause and effect that both advance each other and restrict each other. If technological change including agricultural mechanization has not reached a certain degree, then the advent of the transformation and socialization of the production structure, and the economic structure is not, objectively speaking, required. Conversely, if the scientific research, trial-manufacture and extension of technological changes and agricultural mechanization has advanced somewhat, unless the required changes and adjustments are made in the production structure and structure of agriculture, a situation will be created in which no one will buy the machinery and if they buy the machinery "there will be no place to use it." Agricultural mechanization in the environs of Shanghai is currently in this situation.

During the 60's, Shanghai mechanized irrigation, plowing and raking, crop protection, threshing, and the processing of grain feeds. This had a great effect on freeing the labor force, increasing the labor productivity rate, and lightening the intensity of labor. The 70's began an attack on the problem of the "three stoops" in rice cultivation, but as of now they have not yet been overcome. Presently the number of kinds of farm machines in the Shanghai environs is no less than 15 or 16 and the number of them is also fairly large. Statistics from the end of last year report that the amount of horsepower invested in farm machines stood at more than 2,544,400 horsepower for an average farm machine horsepower per mu of cultivated land of more than 4,400. The level of electricity consumption for agriculture and applications of chemical fertilizers are also quite high, exceeding those of the Soviet Union and being no less than in the United States. But in terms of present agricultural production, it is still basically that obtained from manual labor.

Why, when so much horsepower is used, does no "transformation" take place? One reason is that existing machines are not suited to production or are not completely suited to it; a second reason is the farm machines needed for agricultural production or used in agriculture have not been manufactured; and a third reason is that the costs of using machinery is high, and when there is no shortage of labor there is no objective need for them. Some people say that this is a backing off from agricultural mechanization, but actually it is an exposure of conflicts and the beginning of further advances, because in the farm mechanization process it is common even in foreign countries to have a low rate of utilization for some farm machines. In quite a number of countries it was a rather long time after farm mechanization began until the utilization rate for tractors even reached 20 to 30 percent. It was precisely such "uncertain prospects" that spurred them to create a new situation in farm mechanization. During the past 20 years they have found an outlet from "excess" tractors on the one hand specializing and socializing agriculture and on the other vigorously producing farm implements to hook up to the tractors in order to increase the usefulness and the utilization rate of the tractors. In foreign countries there are as many as between 200 and 300 to 500 or 600 different implement attachments for tractors while the Shanghai Fengshou tractor has only a plow and a rotary cultivator for attachments, so opportunities to use tractors are naturally scant. But the designing of farm implement attachments to meet practical needs is by no means only a matter for farm machinery research and the farm machinery industry; it is inextricably connected to a transformation of the rural economy. In its attack on the "three stoops" Shanghai has designed and promoted, in varying degrees, some farm machines, and quite a few wheat planters have been marketed, but few of them are actually used in rural villages, the reason being that further economic measures for the development of agriculture have not kept pace in present day Shanghai. If agricultural mechanization of the Shanghai environs is to develop, the following must be done:

1. Full and complete development of the rural economy with changes to the economic structure of rural villages and a resolution of the problem of an

excess of farm labor. Only when a shortage of farm labor exists can an objective demand for the use of farm machines be brought about and the performance and quality of farm machinery be brought up to standard. If this is not done, farm machines will not be welcome even if they are improved and give service free of charge. At the present time each production brigade in the Shanghai environs has an average of one rice planter. During the last quarter of 1976 the area planted by rice-planting machines was more than 60 percent, but in 1977 that declined to 8 percent and this year in the course of planting, harvesting and field management virtually no communes and brigades used rice-planting machinery except for a few separate units. The farmers say, "They're not easy to use; they do not pay; and they are not needed." These three "nots" show that farm mechanization must suit objective needs and quality standards, because the labor force in the Shanghai environs, though in short supply at certain seasons, is in excess overall. When there is an excess of labor force, human labor must inevitably be cheap, and the use of embodied labor (machines) will not pay as well as the use of human labor. Consequently, it may be said that to a certain extent agricultural mechanization is forced to occur in circumstances of a shortage of labor. Only through full and complete development of the rural economy and a change in the single-product economy can there be an outlet for the excess labor. The labor put to use in the development of forestry, livestock raising, sideline occupations and the fishing industry in the Shanghai environs during the past few years amounts to only 8 percent of the total labor force. More than 400,000 mu of water is available in the environs for the raising of fish, but if only one-tenth of this were used for pearl production it would be possible to accommodate several tens of thousands; if sloping land along the seawall were used to develop production of lu bamboo and mao bamboo not only could a large volume of raw materials for the manufacture of paper be produced but arrangements could be made for the use of several tens of thousands of laborers. Raising of pigeons and quail and the cultivation of mushrooms and tremella could also soak up large amounts of labor. To fail to develop such commercial production and to stick with "grain, cotton, edible oil" and animal husbandry will mean that the labor force will have no other outlets and the road to agricultural mechanization will be blocked for all practical purposes.

2. Travel the road of a combination of agriculture, industry, and sideline occupations; vigorously develop enterprises in communes and brigades, and increase the level of accumulation of people's communes so as to make ready investment resources for the mechanization of agriculture. Agricultural mechanization will require vast amounts of capital investment. To effect basic mechanization of agriculture in our country, if investment is calculated at 500 yuan per mu, most production brigades in the Shanghai environs would require about 100,000 yuan. At the present time, however, annual accumulations from agriculture for a production brigade is 3,000 to 4,000 yuan. Through the growth of commune and brigade enterprises accumulations can be increased. In this regard, conditions in Shanghai are good with a lot of latent potential. Since 1970, 80 percent of mechanization



of agriculture throughout the environs has been purchased with accumulations that brigades and communes have earned in agriculture. But insufficient enthusiasm for this action on the part of some cadres in the city, plus some unreasonable regulations, has hampered growth of enterprises in brigades and communes. If vigorous growth of commune and brigade enterprises is to take place, there will have to be some lifting of the restrictions imposed in the past. For example, the past proscription of the use in industry of commune and brigade labor in excess of 25 percent, and the requirement that brigade and commune enterprises must obtain raw materials locally, produce things locally, and sell things locally. Such restrictions are unreasonable. If commune and brigade enterprises are to serve agricultural production, the livelihoods of people in the city and the countryside, large scale industry, and the needs of foreign trade, it will be difficult to adhere totally to the "three locals." Commune and brigade enterprises in the environs are truly reserve bases for Shanghai's large enterprises, and they are capable of taking on processing work and the distribution of products for large enterprises. There exists in the Shanghai environs an exceptionally large construction force, some of it possessing very high skills in working with cement and plaster, carpentry work, and bamboo construction. To require them to limit their work to local production is just like forcing them to steel food to eat from agriculture. In actual fact, there is an extreme need for such a labor force in urban construction work, and if urban construction departments can do more in the way of contracting for construction projects, construction will be speeded up.

3. Set a course and a direction for the growth of agriculture in the environs so as to cut down on the amount of undirected farm machinery research, manufacturing of prototypes, and promotion that goes on. Agriculture in the environs of cities should emphasize the cultivation of vegetables and fruits, and the raising of poultry and barnyard animals as well as the development of aquatic products. But inasmuch as Shanghai presently must assure annual purchase quotas of 800 million jin of commodity grain and inasmuch as about one-fourth of the cultivated land area must be planted to cotton, the rate of self-consumption of supplementary foodstuffs is not high and supplies are short. Should agricultural mechanization in the Shanghai environs be planned and carried out on the basis of requirements for feed crops or should the attack be continued against the "three stoops" in the paddy field industry? A lot of farm machinery technicians feel very uncertain.

4. The growing and aquatic breeding industries must be regionalized and specialized. Historically, regionalization of agriculture in Shanghai has been virtually complete, but, if true agricultural mechanization is to come about, it will be necessary gradually to change the current situation wherein each production brigade plants a little of everything and raises a little of everything to a situation in which single crops are grown to the fullest extent possible, the production area is widened to the fullest extent possible, and the number of things done is simplified



to the fullest extent possible. Only in this way can the kinds and numbers of farm machines bought by each economic unit be kept to the minimum possible. Unless this is done, agricultural mechanization will be difficult.

5. Capital construction for water conservancy must also be thought of in terms of mechanization, modernization and specialization, and socialized production. In recent years many canals have been opened in the environs and quite a bit of land has been leveled, but road construction and bridge building has not kept up. In the distant suburbs some communes have machines but no roads. If transportation is to be mechanized, roads and bridges in rural areas must be thoroughly taken in hand. Once a transformation has taken place in the economic structure of agriculture, research, manufacture of prototypes and the promotion of farm machinery must be set on a practical and productive course. In view of the practice and experience of the past 20 years and considering the need for intensive cultivation with consistently high yields, the mechanization of agriculture must go hand-in-hand with modernization of other kinds before it can show greater and greater economic results. Shanghai food production now stands at an average of about 1,600 jin per mu, and some brigades and communes have exceeded a ton of foodstuffs per mu. The fullness of land use, the high degree of agricultural skill, and the complexity of tasks performed far outdistances the capabilities of existing farm machinery. Consequently, mechanization must go hand-in-hand with use of superior breeds, water conservancy work, use of chemicals, and electrification if it is to attain such high levels of production. At the same time mechanization must include a full range of equipment. The design and manufacture of farm machinery must develop in the direction of full interchangeability. If it does not, and a particular machine is required for each particular job, how will anybody be able to afford them? A cost accounting system for the construction of farm machinery and improvement in the management of farm machinery are decisive measures for improvement in the economic effectiveness of farm machinery. Economic effectiveness can vary by several hundred percent or even several thousand percent depending on how good management is and how well matched the equipment. At the present time, rare are the good and numerous are the poor cases of management. The narrow mindedness and the force of habit that small-scale production engenders must be broken to bring ways of thinking into accord with the development of agricultural modernization and to develop a rational system of management for farm machinery.

The size of economic benefits of agricultural mechanization cannot be examined purely from the standpoint of the efficiency of farm machines but must be examined and evaluated on the basis of the three criteria of field productivity, labor productivity, and increase in net value of production. In the environs of Shanghai where land is scant and people numerous, the labor force increases year after year and labor force resources are much more plentiful than land resources. For this reason, in any weighing of the size of the achievements of agricultural mechanization in the Shanghai environs, a look at whether land productivity has

increased appears even more important. Unless it is able to make a contribution in this area, agricultural mechanization loses significance. Looked at from the standpoint of these criteria, not only are the technical requirements for agricultural mechanization higher but also required is that the ratio of industry and sideline industry in the agricultural economy vastly exceeds that of agriculture so that excess labor in rural villages will never run out of work to do, and so that accumulations from agriculture will suffice to pay for the investment of capital in agricultural mechanization. At the same time, the composition and allocation of agriculture, regulations on farming, measures for increases, and requirements for farming skills must all fit the requirements of mechanization. In this way the amount of unguided activity can be reduced, ineffective investment avoided, and travel over winding roads be decreased.

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## BRIEFS

YENGISAR COUNTY AFFORESTATION, LIVESTOCK--Yengisar County, Xinjiang, planted 8.41 million trees this spring, and raised 159,511 head of livestock by end of last September, of which 81,645 head were raised by individual households. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 13 Nov 79 OW]

XINJIANG PREFECTURE ANIMAL HUSBANDRY--Urumqi, 5 Nov--Altay Prefecture in Xinjiang has scored fine achievements in livestock breeding this year. Despite serious windstorms and snowstorms in the spring, a total of 1.03 head of newly born animals have survived, with the survival rate of 94 percent. The prefecture is expected to deliver 370,000 head of marketable livestock to the state, a 20 percent increase over last year. This year, the prefecture has built more than 9,000 animal pens and sheds, irrigated 580,000 mu of grassland, and collected 350 million jin of fodder grass. [Beijing XINHUA Domestic Service in Chinese 0716 GMT 5 Nov 79 OW]

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BRIEFS

ANIMAL HUSBANDRY--Lhasa, 11 Nov--The policy of "simultaneous development of farming and animal husbandry" has been changed to "taking animal husbandry as the key link" in 22 counties and a number of districts and communes. The change was made in accordance with local conditions and has been warmly welcomed by the local people. [Beijing Xinhua Domestic Service in Chinese 0200 GMT 11 Nov 79 OW]

FLOUR PRODUCTION--The Lhasa grain and oil-bearing crop processing plant in Lhasa city, Xizang, has fulfilled the annual target of processing 12 million jin of flour as of 30 October. It has made a profit of 220,000 yuan for the state. [Lhasa Xizang Regional Service in Mandarin 1100 GMT 10 Nov 79 OW]

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## BRIEFS

**YUNNAN RURAL CADRES CLASS**--The first training class on management of people's communes opened in Kunming on 22 October. Two hundred cadres from Sichuan, Quizhou, Xizang and Yunnan attended. The training class was sponsored by the Ministry of Agriculture of the State Council, which entrusted the Yunnan Agriculture Bureau to set it up. Some 20 teachers from the Southwest Agricultural Institute, Quizhou Agricultural Institute and Yunnan Agricultural University were invited to lecture on 18 topics. [Kunming Yunnan Provincial Service in Mandarin 1100 GMT on 18 topics. [Kunming Yunnan Provincial Service in Mandarin 1100 GMT 27 Oct 79 HK]

**PIG PROCUREMENT**--From January to September 1979, 1.8 million pigs had been procured, an increase of 136,000 over the corresponding period of 1978. The average gross weight of each pig was 71.3 kg, an increase of 3 kg over last year. The average gross weight of each pig in Qujing, Yuxi and Zhaotong prefectures was 82 kg. Yunnan has achieved good results in pig raising this year because the state has increased the price of pigs and other agricultural products. This has mobilized the activism of the commune members and masses in production and procurement. [Kunming Yunnan Provincial Service in Mandarin 1100 GMT 1 Nov 79 HK]

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WINTER SOWING PLANS IN JIAXING PREFECTURE READJUSTED

Beijing RENMIN RIBAO in Chinese 7 Sep 79 p 2

[Article: "Jiaxing Prefecture Shows Continuous Increases in Production and in Income. Rational Adjustment of Winter Sowing Patterns With a Single Initiative Causing Numerous Initiatives"]

[Excerpts] On the beautiful and richly endowed Hangjia Lake Plain in Zhejiang Province, an adjustment to the agricultural pattern has earned another bumper harvest in spring harvested crops and early rice on top of the bumper harvest of last year. The broad masses of peasant homes have a surfeit of grain and the banks have savings deposits, joyously building Jiaxing Prefecture, according to the plan and policy for agricultural development formulated by the Third Plenary Session, to become in fact as well as in name the "silk capital" and a "land of plenty."

For the past number of years the principal winter crops of Jiaxing Prefecture have been wheat, barley, rape, and green manure. The Prefectural Committee learned, as a result of a representative sampling, that there are many benefits to be derived from the extensive planting of rape:

1. It benefits both use of the fields and nurture of the fields promoting increased food yields throughout the year. In a comparison of fields where rape had been grown with fields where spring wheat had been grown, early rice production averaged per mu increases in yields of between 50 and 100 jin and oil cake would be left to serve as fertilizer for late rice.
2. Early ripening rape can be harvested between 10 and 15 days earlier than wheat; it can ease the shortage of labor in the busy planting and harvest seasons; it can help the entire prefecture's 300,000 mu of early rice avoid the high temperatures of early July that cause premature ripening; and it helps promote the growth of a number of other businesses of various kinds such as silkworm cocoons and fresh water fish.
3. Costs for rape are quite low yet benefits are high with consequent benefits to the income of commune members. The Jiaxing Prefecture Committee, after repeated weighing of the pros and cons and the profits and losses, 2 years ago put forward a program of winter sowing production of "keep green fertilizer at current levels; reduce spring wheat, and expand rape."

This pattern of winter sowing is suited to the weather, to land productivity, and to the desires of the people; as a result bumper harvests were reaped last spring from rape seeds and from spring grains with rape seeds averaging per mu yields of 168 jin as compared with 103 jin 2 years ago for a total yield increase of more than 700,000 dan or an increase of more than 800 percent. The aggregate yield of single season spring grain increased by 360 million jin. Because of this clever chess move in the pattern of winter sowing, a single initiative has resulted in numerous initiatives. Last year, with the exception of reduced production of silkworm cocoons, increases were registered throughout the prefecture in production from agriculture, forestry, livestock raising, sideline occupations and fisheries with aggregate production of grain increasing to 1.18 billion jin, and collective income increasing to more than 210 million of which income from various businesses amounted to 360 million, an increase of more than 100 million yuan over 1977.

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## ZHEJIANG

### BRIEFS

**ZHEJIANG HYBRID RICE**—Wencheng County in Zhejiang has reaped a bumper harvest on 19,000 mu of hybrid rice. The average per-mu yield is 1,209 jin. The total output is 2.97 million jin over last year. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 31 Oct 79 OW]

**FARM PRODUCTION**—Jiangshan County has harvested 114,000 mu of late rice, sown 5,000 mu of wheat and barley and cultivated 5,800 mu of rape saplings. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 8 Nov 79 OW]

**ZHEJIANG NEW RESERVOIR**—The major projects of (Changdao) Reservoir were recently completed in Zhejiang. Located at Xinchang County, the reservoir is capable of holding 160 million cubic meters of water, protecting 130,000 mu of farmland along the Caojiang River from floods, and irrigating 200,000 mu of farmland in Xinchang, Shangyu and Sheng counties. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 7 Nov 79 OW]

**ZHEJIANG COUNTRY AFFORESTATION**—This spring, Kaihua County in Zhejiang afforested 83,000 mu of land and overfulfilled the annual target by 19 percent. It also nurtured 137,000 mu of saplings, afforested 270,000 mu of hillsides and delivered 70,000 cubic meters of timber to the state. Since 1971, Kaihua County has afforested 2.34 million mu of land, or 85 percent of the county's area suitable for afforestation. The county has now a timber reserve totalling 5.10 million cubic meters. [Beijing XINHUA Domestic Service in Chinese 0234 GMT 7 Nov 79 OW]

**RESPONSIBILITY SYSTEM BOOSTS FARM OUTPUT**—Following last year's big increase in farm production, Shaoxing County again reaped a bumper grain harvest this spring as a result of the resumption of a responsibility system for rural production work. The total spring grain output was 34 percent higher than that of last year, while the per-mu yield rose more than 100 jin. The total and per-mu yield of rapeseeds rose 18.7 and 20 percent respectively. [Text] [Beijing RENMIN RIBAO in Chinese 21 Sep 79 p 2]

JIANGSHAN COUNTY HARVEST, PLANTING--Jiangshan County, Zhejiang, is to complete autumn harvesting and winter planting on 478,000 mu of farmland within a month. As of 6 November, it had harvested 167,000 mu of hybrid late rice which accounted for 75.8 percent of the total acreage of hybrid late rice. The 15,000 mu of single-cropping late rice have all been harvested. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 10 Nov 79 OW]

KAIHUA COUNTY 'EXPERIMENTAL HILLS'--Kaihua County, Zhejiang, is actively promoting afforestation by encouraging establishment of "three-in-one experimental hills" in the county. The county has now 5,400 mu of such hills on which pines, cedars and other trees are planted and taken care of jointly by the county's cadres, forestry workers and technicians. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 9 Nov 79 OW]

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